

Bob Cooper's

MAY 15 2005

SatFACTS

MONTHLY



Reporting on "The World" of satellite television in the Pacific and Asia

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**Multi-Sat
Sphericals:
Then & Now**

**MATV: Digital
Terrestrial
Challenge**

**MBSat combines
'S' and 'Ku'
Uniquely**

- ✓ Latest Programmer
News
- ✓ Latest Hardware News
- ✓ X Digital Updates
- ✓ Observer Reports

Vol. 11 ♦ No. 129

Price Per Copy:

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Specials this month

DT800PVR - Digital Receiver



- 40Gb HDD = 40hr Record time
- 2x CI CAM Slots
- DiSEqC 1.2
- **Fibre Optic Output Capability**
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Satlook - Signal Meter



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- A must for the professional
- Simple menus and functions
- Price: Phone up for Quote

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- DiSEqC 1.2
- User Friendly
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Everything? Yeah we got

LNB

- Zinwell C Band
- Zinwell KU Band
- MTI C Band, Superhigh gain
- One Cable Solution - CBand
- Dual Output KU 11300 MHz

Positioners

- Superjack EZ-2000
- Superjack DP-6600, DiSEqC 1.0/1.2
- Technosat DP-200, DiSEqC 1.2
- Manual Actuator Driver - EW101
- SAP 2000: 99 Memory positioner

Actuators

- Superjack HARL-3618, 18" Actuator
- Superjack HARL-3624, 24" Actuator
- Superjack DG-120, H/H Mount

Receivers

- SuperNET CA, Irdeto Embedded
- Success, Free-to-Air
- Dion DT-370, Free-to-Air Receiver
- Dion 2x CI, Hardware AllCAMed
- ChangHong, Mediaguard embedded
- SuperNET Terrestrial, DVB-T
- Phoenix High Definition STB

Dish and mounts

- 1.2, 1.8m Solid Prime focus
- 45, 60, 65, 85cm KU dish Offset
- **2.13m, 2.27m, 2.4m, 3.0m, 3.07m, 3.7m, Mesh Dish, Light and Heavy Duty PSI and JOYSAT Available**
- CBand Wall brackets
- CBand Concrete mounts and stands
- KU Gutter mounts
- KU Wall mounts
- KU Float mounts
- KU Tinroof mount

Dion 818 CI - Digital Satellite Receiver



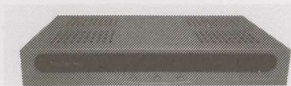
- Slim Size and User Friendly OSD
- 2x CI (Common Interface) slots
- Hardware AllCAMed

SuperJack H-H Actuator, DiSEqC embedded



- All it takes is one coaxial cable....
- NO MOTOR CABLE REQUIRED**
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Supernet - Terrestrial DVB-T



- Digital Terrestrial Receiver
- Slim Design
- High Quality Picture
- Easy to install and use

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- 0/22kHz switches
- 2 and 4 way cable splitters
- V/H Multiswitch
- 0/12V Switch

Cable - 15m, 25m, 305m packs

- RG6-U Dual Shield Coaxial Cable
- RG6-U Quad Shield Coaxial Cable
- Cat5 Actuator Cable

Plugs

- F Connectors, Screw or Clamp types
- Cable joiners
- AV Splitters
- Cable Strippers
- Cable clampers
- Various other joiners and accessories e.g. RCA/SCART cables and converters

Misc

- 2.4GHz AV Sender
- Irdeto 2.06B CAMs, Viaccess CAMs
- Satlook Digital Signal Meter
- Satlook Analogue Signal Meter
- Satlook Digital + Analogue combo
- Satellite finders
- Angle level measure instrument
- High Quality Compasses



SatFACTS MONTHLY

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This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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our ELEVENTH year!

COOP'S COMMENT

One of my favourite adages is, "If you do not understand history, you are doomed to repeat its' failures". Age, and experience, and a solid memory are wonderful attributes in an era when 180 degree changes are taking place faster than we can count the electrons flowing by. This is one of those epoch-making times in history. You will not, in ten or twenty years, recall 2005 as 'the good old days' but you will remember how what happened today, this month, this year, changed forever the way you access television, do business, make a living. Depending upon your attitude as you read this, this are the best of the worst times, or, the worst of the best times.

Form the 1936 launch of all-electronic BBC television (London), through the WW2 stunted semi-launch of American commercial TV (July 1, 1941), then to Australia's launch of TV (1956) and finally New Zealand's fledgling era (1960), TV broadcast has followed in the radio broadcasting pathway. Someone (government or private) builds a transmitter and emits into the ether a TV channel. In the hinterlands, the multitudes have spent their money to acquire a receiver with the associated apparatus (antenna, lead-in wire) and the programming has been "free to view". This is the end of that 60 year era, dissolving into the history books faster than you can say 'FTA'.

Television advertising revenue (the money broadcasters collect to reach viewers with commercial messages) is reaching a plateau, challenged by revenue generated by firms who deliver television in a 'PtV' (pay to view) format. A myriad of associated support industries from TV set makers to those who build TV reception antennas and videotape recorders are caught in the middle as the scale tips away from FTA to 'PtV'.

A generation of youthful consumers, now entering the all important buy-buy-buy era of their lives, has grown up on Playstations, rental movies, text messaging phones and ripping off music companies with Internet P2P (peer to peer) file sharing. This is no longer your grandfather's world; if you are over 30, it is no longer 'your' world.

In less than ten years of commercial availability, cell phones have become an essential part of the under-30 lifestyle. For someplace between \$100 and \$1,000, ownership of this device has become so important to lifestyles that to not have one is to be an outcast, a 'relic' and a non-conformist. An eighteen year old who is considered a 'non-conformist' is all but ostracised by his peers and a 13 year old without a cell phone is only allowed to sit at the back of the school bus.

Now comes 'standard 3G' which in addition to allowing 1,000 text messages per month for a flat \$10 rate, instant photographic ability complete with cell phone file storage of images captured and world-wide sharing of those images, will add world-wide access to television programming 'in your pocket' no matter where you roam. 'American Idol' live and direct while travelling in Saigon? \$5. NZ Rugby as the match is played while on an aeroplane crossing the North Pole to London? \$10. You name the program, 3G will have it. For a fee; 'PtV' world-wide through the magic of your Nokia or Motorola palm sized link to home and the world.

Television New Zealand was at one time the essence of a nation's lifestyle. ABC Australia was equally important as a 'messenger' connecting millions of homes to a common experience, a form of nationalism (common events shared simultaneously by the nation as a whole). Neither will graduate to the '3G' era and retain their former importance, or even their present 'tarnished' image, without major changes in direction and presentation.

50-60 year olds operating these and similar networks are past their prime, unable to properly identify with the 10-30 year olds who will, quickly, dominate the world of information, entertainment and education. Television is itself about to be superseded by a consortium of loosely aligned delivery systems that will, if nothing else, redefine the 'broad' in broadcasting around the reality that 'PtV' is the next fast approaching era of the medium. Television? Give us ten years and we may not even spell it the same! (PtV copyrighted R.B. Cooper; 2005)

In Volume 11 ♦ Number 129

Swan Spherical: The multi-sat antenna design that refuses to die -p. 6

MATV? The digital dilemma -p. 10

Satellites and Cell Phone TV: PtV replacing FTA -p. 18

Strong's "X-Digital" just gets better -p. 22

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Programmer/Programming -p.2; Hardware/Equipment Update -p. 4; SatFACTS Digital Watch -p. 23;

Supplemental Data -p. 26; With The Observers -p. 27; Satmax seminars; 'The Flag' -p.28;

Addendum, Ten Year Anthology -p. 31

-On the cover-

Big, broken, and a link to your present: The Swan Spherical multi-sat antenna (see p. 6).



May 15, 2005

PROGRAMMER
PROGRAMMING
PROMOTION

UPDATE

MAY 15, 2005

One man's beauty ...

"That is a beautiful structure on the front cover (SF#128), with a wee glimpse of 'paradise' also showing beyond Cliff Knight's shoulder! And as for the Dreambox 7020 heat - I can say with plenty of experience with the DBox2 - the newest version runs absolutely cold (as an aside, I am now scrounging for more firewood having lost the heat box!)."

SM, New Zealand

DVI et al

"I have heard critics suggest you are pushing a snowball uphill in the middle of summer, with your reports on the status of HDTV, so I wanted to counter those comments. The March and April issues of SatFACTS have been truly great in a long history of being leading edge and on the mark of break through technology. Everything I read in SatFACTS about the status of digital TV in Australia, HDTV, the hardware available, has been spot on. And I am employed by a major supplier of receivers and STBs and deal with these issues daily, so recognise the 'truth' when I see it. I love this country, what it stands for, and how willing it is to grab hold of new developments, but the current lack of interest in conversion to DVB-T or heaven-forbid HDTV can only be laid at the doorstep of politicians who dance to the drummers at Net 9 and their competitors. To allow something with such great potential to be buried by bureaucratic and political agendas is a mark against the greatness that Australia so often exhibits in other areas of commerce. We did it first (nice) but we are doing it wrong (not so nice). I lament for what we might have done; 'Don't cry for me Argentina' has a new competitor: 'Don't cry for me, Australia'."

Employed in the day to day DVB-T
Grind

Our series continues with a look at the problems associated with MATV installations including the slow awakening to the fact that existing analogue systems often do not work with DVB-T (p. 10).

Demonstrating satellite TV to consumers. Although not the business model it might have been five years ago (prior to the TARBS or follow-on UBI fiasco), ethnic television service remains a viable business for many who sell and install dishes. So how do you properly demonstrate, without multiple antennas, receivers, motorised dish movers, either the great variety available on satellite, or, specific services such as Pakistani TV? Mark Fahey, a veteran with superb credentials in our world, has a nifty answer: A DVD(-ROM) package (6 total in professionally produced carrying case) called Satdirectory with virtually every FTA TV (and radio - over 14 hours of radio services) included. Typical 'excerpts' run 3 to 4 minutes in length, video quality is excellent and the concept is you pop the DVD into a player and say to the consumer, "Here it is - Viet Nam TV on satellite - see for yourself"! While creator Fahey suggests, "*This is no substitute for Lyngsat.com or Apsattv.com*", for most users the fluid nature of the Clarke orbit belt's daily-weekly changes will be but a minor negative to owning, using and showcasing this incredibly fairly priced tool (connect a DVD player to a TV set, let the Satdirectory collection become a kaleidoscope of 'the world via television' in your showroom). Highly recommended at A\$49.95 plus shipping. Contact mfahey@bigpond.com.

Russian AM3, 16C-band and 12 Ku to 140E but with C likely only 'to north' continues to be scheduled for June 24th launch.

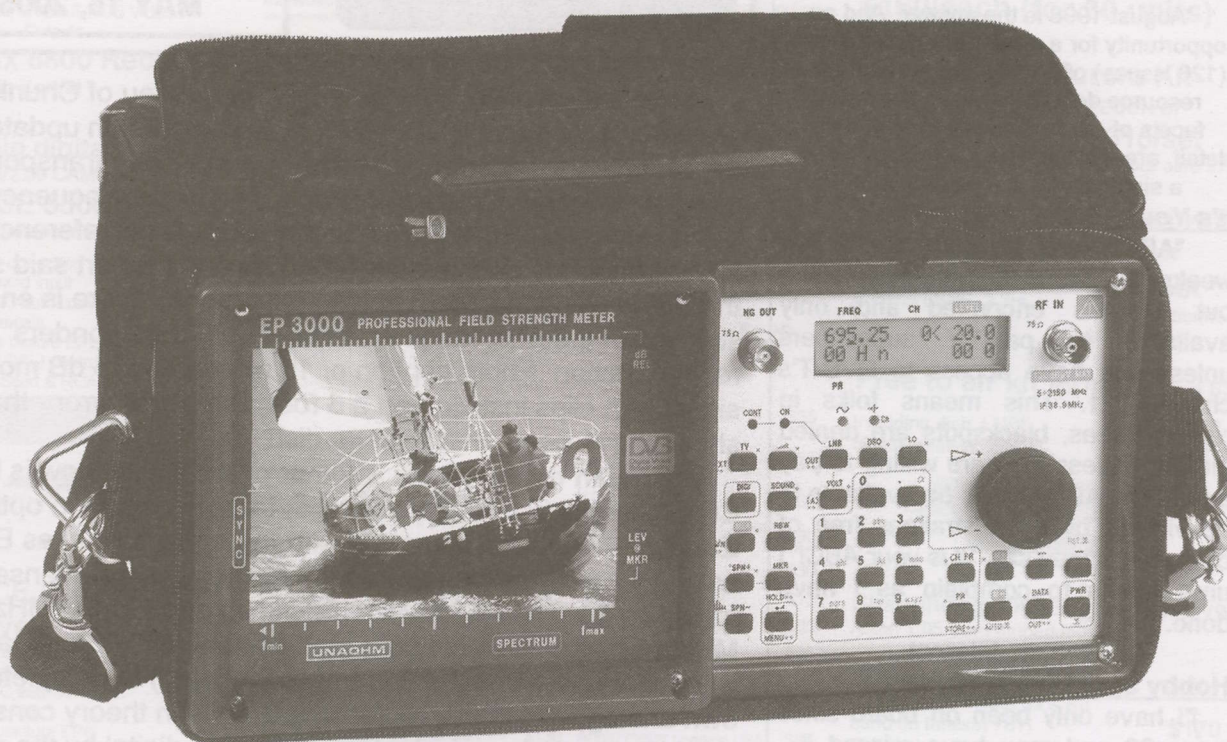
TVNZ digital; FTA satellite and possibly terrestrial. Still no official word in form of company release but making rounds of advertising agencies and others involved in promotion, "late in 2005 or early in 2006" is the almost official line, presently. Advertisers are being told 'interactive content' will be the hoped-for 'killer application'. Same reports say, "You will need a satellite dish and a set-top unit to pick up these channels, but if you are already a Sky Digital subscriber, no need for second STB". That of course suggests Sky will "co-operate" to the extent that the FTAs will be accessible with Sky boxes - perhaps not universally true given the wide range of ever changing Sky STB models down through the years.

Invacom low noise LNBF and LNB products, VSAT products now available at DMS International (<http://www.dmsiusa.com>); models carry five year warranty which may be industry first.

Selectv is new name for i-view firm proposing to create 35-40 non-English channel packaged service (through PAS-8, Ku; using transponders abandoned by TARBS). They plan uplink from Hong Kong, expect to raise A\$30,000,000 to fund venture ("projecting 40,000 subscribers and profits in 4 years"); prospectus scheduled to be released early June with 'test mode' transmissions scheduled at end of May.

Expensive. When TVNZ cancelled Pacific region satellite service feeds, 6PM news widely seen in islands went away. Fiji TV is asking \$700 per hour to link it to prior TVNZ users.

History's on our side



Unaohm pioneered many of the TV measurement functions we've all come to trust.

- 1955 First VHF needle reading TV signal level meter.
- 1961 First UHF needle reading TV signal level meter.
- 1962 First VHF-UHF needle reading TV signal level meter.
- 1969 First TV meter incorporating an 11" B/W monitor.
- 1972 First TV meter incorporating a 6" B/W monitor.
- 1978 First TV meter with Analyser and Marker.
- 1981 First meter w. Analyser, Sync Pulse & Program store.
- 1983 First meter with Frequency readout and Audio tone.
- 1987 First TV meter with teletext decoding and analysis.
- 1998 First DVB complete BER measurement system.
- 2004 First DVB Adaptive Equaliser display.

Unaohm is a better meter too. Recent comparisons by RAI and Foxtel engineering departments confirm Unaohm are the first TV meters to get their Digital measurements right!

For reliability and function you owe it to yourself to check Unaohm out, at Lacey's.tv.

Easy to use with a huge function range.

Sole and exclusive Australian distributor:

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Tel (03) 9783 2388 Fax (03) 9783 5767

branches in Sydney, Ulverstone & Woolgoolga.

e-mail: info@laceys.tv www.laceys.tv

Pietro's Polar Tracking

"We are trying to locate the article describing proper polar mounting dish installation steps and tuning techniques. Which one was it?"

Peter Deavin, Rick Dalton TV

August 1998 is the answer. And an opportunity for a reminder - all ten years (120 issues) of SatFACTS, an incredible resource describing the many many facets of our technology in hands-on detail, are available as a ten CD set or on a single DVD; see page 32 here!

It's Your ABC!

"ABC2 was available for a few weeks on Aurora (C1) after launching but now is encrypted and only available to pay-TV subscribers unless you have access to DVB-T's channel 21. This means folks in remote areas, blackspots are denied viewing unless they are willing to pay a fee. The ABC should be available to be viewed by *all* Australians free of charge - as they say, 'It is your ABC!' I urge others to complain as I have done."

Ron via Internet

Hobby Spectrum Analyser?

"I have only been on board since issue 96 and may have missed it - could SF review the Satlook Spectrum Analyser in an upcoming issue? They seem to be a fair bit less expensive than Unaohm but for a hobbyist or home handyman, they might be just the ticket? And if you have reviewed it previously, what say you?"

Paul, Sydney

We say SF#87 did carry the review and we found the device to be extremely versatile and useful - at the hobbyist level.

In fact, if you took the time to create a calibration reference for it (by using known signal levels from another meter) it would also do nicely for installers.

However, the 'Mark III' will only demodulate (show on the built-in screen) analogue signals so the 'TV set' portion of it has limited ability these days. Satlook is available from Skandia Electronics PL, Hawthorn, Victoria (61-3-9819-2466; www.skandia.com.au), and, in 3 versions (including NIT logging) from Phoenix Technologies (see p. 5, here).

Russian TV?

"My wife is a Russian immigrant to NZ; is there a selection of her home country programming available on satellite?"

John Edwards, TeAwamutu, NZ

"Selection?" No, and the business plan for such a service existing is poor even when Australia is added (not enough

HARDWARE EQUIPMENT PARTS

UPDATE

MAY 15, 2005

Technical error(s): Bill Hyman's "Clips in lieu of Chunks to create circular polarity" (SF#128, p. 8) requires an update. When the report was written, Fiji TV was operating two transponders using a temporary ('flyaway') uplink. The upper frequency transponder (4095LHC) was, at that time, -2 dB reference the lower frequency transponder (4055) and the report said so. Now that Fiji is using their own uplink, Bill reports, "there is enough signal with the ADL feedhorn to load both transponders". And a real correction: Photo caption p. 10 referenced "5 dB more signal with clips installed on a 6 foot dish" - our error - that should have been on a 5 metre dish.

Australian digital radio. Another political sideshow is brewing. CRA (Commercial Radio Australia) trade association opting for Eureka 147 (L band if created with the same format as Europe), asking for ten year moratorium on new broadcast licenses while transition from AM (535 kHz>1605 kHz) and FM (88 MHz>108 MHz) occurs. CRA's concept runs parallel to TV broadcasters who have until 2008 (as currently scheduled) to complete their own analogue to digital replacement while in theory consumers would have made a similar 'conversion' to digital by the same date, at which analogue TV would be turned off (at least in major cities). CRA says they need ten years to create Eureka 147, and to allow consumers to replace existing AM and FM radios with L-band gear. CRA wants government to 'give' broadcasters the new Eureka 147 'channels' without cost, to partially offset the money each station will spend on converting AM or FM. Then when ten years is up, all AM and FMs leave the air, and government gets their frequencies back (to then resell to some yet to be defined new category of user). Eureka 147 requires on-channel repeaters (picture cell phone sites) every 20 miles or so in clear country, much more often in hilly-mountainous terrain and being 'digital' means there is no such thing as sub-marginal noisy reception - only 'perfect' and 'none at all'. For many Australians, it would spell the end to ANY radio reception.

DVB-H (TV reception via handhelds). A group of 12 prominent (Nokia, Texas Instruments included) firms are backing a new software/technical standard which they hope will become 'defacto' for rolling out this new service in North America, Europe and Asia. Their concept is newly emerging DVB-T replacement channels (for older analogue service channels) can be technically modified, adding a new 'data stream' inside of the digital DVB-T transmission channel, which will be/is designed specifically for 'robustness' to mobile and city-centre-buried handheld receivers. They claim DVB-T (SDTV and HDTV) can co-exist through a single (VHF or UHF) 'terrestrial multiplex' with DVB-H giving broadcasters a leg up on serving palm sized receivers against the newly emerging telephone industry's plan to super-compress TV for delivery as an added data stream within the overall cell phone service business (see p. 18).



Phoenix Technologies



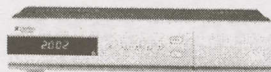
Satellite Equipment & Accessories One Stop Supermarket

Phoenix JT3100T Digital Terrestrial Receiver

- Digital Audio Output (S/PDIF)
- Dolby Digital
- Wide Screen (16:9) Hot-Key
- S-VHS, CVBS & RGB Video Outputs

Magix 8800 Receiver
(Made in Korea)

\$220



- Super-Fast Channel Scan
- Electronic Program Guide
- Channel Rename Function
- Software Upgradeable

\$180/each (for 6 unit)

\$160/each (for 30 units)

Coship digital receiver
(Iredto V2.09 CAM embedded)

\$220

SPACE 5300A CI Receiver
(Two Common Interface Slots)

Auto PID correction
C & Ku band input
PAL/NTSC auto converter
5000 channels
Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA output

\$180

NextWave 3220 FTA digital receiver
(Made in Korea)

C & Ku band input, PAL/NTSC auto converter
5000 channels Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA outputs

\$160

NextWave 3220C digital receiver
(Two common interface slots) (Made in Korea)

C & Ku band input
High symbol rate >45,000
PAL/NTSC auto converter
5000 channels Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA outputs

\$220

Optus C1 Aurora Kit

Coship digital receiver

(Iredto cam embedded)
11.3 GHz/Universal Ku
LNBF, 75cm dish, Mount
bracket.

\$315/set

+Aurora card \$75

LBC, ART, Al Jazeera Kit

Coship digital receiver

(Iredto cam embedded)
C-band LNBF, 2.3m
Mesh dish.

\$435/set

+Subscription fee
\$20/month*

Free to air kit (for NSS 6, Optus B3)

Including dish, LNBF,
digital receiver, etc.

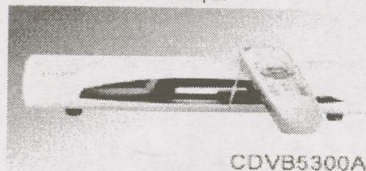
**Start from
\$250/set**



Changhong 1000 Digital Receiver
Aston 1.05 Cam embedded

Best Value For Indian & French
(C-band on Asiasat 3s & Ku
band on Intelsat 701)
C & Ku band input, 2000
Channels.

\$170



CDVB5300A

SPACE 2300 digital receiver

Auto PID correction
C & Ku band input
PAL/NTSC auto converter
5000 channels
Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA output

\$140

Iredto 2.06B CAM	\$140	Zinwell C band LNBF	\$35
Viaccess CAM	\$140	Zinwell 10.70/11.3	\$25
65cm offset dish	\$27	/Universal Ku band LNBF	
75cm offset dish	\$40	MTI C band LNBF	\$35
Superjack DiSEqC	\$95	One cable solution C-band LNBF	\$50
1.2 motor			
Universal Mount	\$15	Satellite finder	\$30
2.1m mesh dish	\$120	Silver Card (10/bag)	\$125
2.3m mesh dish (motorized)	\$170	Gold Card (10/bag)	\$85
2.4m heavy duty mesh dish (motorized)	\$210	RG6 Stripper	\$20
1.8m 6 panel dish	\$130	RG6/11 Crimper	\$30
RG 6 Dual cable (305m/roll)	\$75	Angle meter (made in USA)	\$85
		Compass	\$30

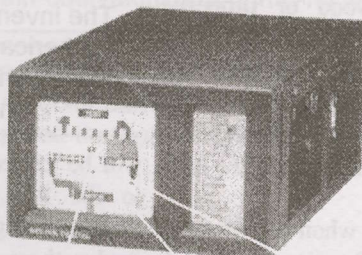
(Top quality) TESTING EQUIPMENT SPECIAL (made in Sweden)

Satlook MARK III \$950

- 4.5" B/W monitor for PAL/NTSC/SECAM
- Satellite-receiver 920-2150 MHz
- Tunable sound 5.5-8.5 MHz
- Spectrum analyzer
- Expanded spectrum
- LNB voltage 13/18 V
- 22 kHz tone switch
- KU- and C-band (normal/inverted video)
- Built in rechargeable battery
- Only 3.5 kg complete with carrying-case

Satlook Digital NIT \$1550

We are pleased to introduce our new SATLOOK Digital NIT. NIT stands for NETWORK INFORMATION TABLE, which today almost all DVB-satellites transmit as standard. The NIT contains information about the Satellite and TV/Radio-channels. It's very easy to identify a Satellite when reading out this information. The different TV/Radio-channels on a transponder can also be read-out.



Satlook COMBO \$2550

- Input frequency: 2-900 MHz and 920-2150 MHz
- 4.5" B/W Monitor for PAL/NTSC/SECAM
- Lots of memory positions for spectrum pictures
- RS232 for PC-connection
- Built in, rechargeable battery. Only 7kg complete with carrying case
- TV-PART:**
 - 2-900 MHz spectrum analyzer
 - Presents full range spectrum (and expanded)
 - Very high accuracy, $\pm 1\text{dB}$ (at 20°C)
- SAT-part:**
 - 920-2150MHz spectrum analyzer. Digital BER, QPSK and S/N-ratio
 - Satellite-ID and TV/Radio-channel info (NIT)
 - Tunable audio bandwidth 5.5-8.5MHz
 - LNB voltage 13/18V, 22kHz tone switch
 - DiSEqC according to level 1.0, 1.1, 1.2
 - KU- and C-band (normal/inverted video)

Full range of C/Ku band satellite dish - panel & mesh, prime & offset, from 45cm to 4.5m

Full range of Zinwell, MTI C/Ku LNBF - Dual output, one cable solution, C/Ku combination

Full range of actuator - From 12" light to 36" heavy duty

DiSEqC 1.2 Positioner & SuperJack EZ2000 Positioner

2.4 GHz AV sender and Remote extender

RG6 Cable and Motor cable

Full range of satellite accessories



THIS MONTH SPECIAL



SPACE 2300A FTA Digital Receiver \$1300/(10 units)
Magix 8800 Digital Receiver \$1200/(6 units)

Phoenix 2.3m Mesh dish \$1650/(pallet of 10 sets)
Zinwell LNBF 15K C-band LNBF \$648/(box of 24 units)

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Phone: (03) 9553 3399 Fax: (03) 9553 3393
E-mail: sales@phoenixsatellite.com.au

The Swan Spherical: Cheap, Multi-Satellite, Hand Tools

Garry Cratt (Avcomm), in forwarding a communiqué from Graham Bennett (gdbennett@austarnet.com.au) provides the basis for this report. In the great outback of Queensland, at 15.5S and 142.5E, the Kowanyama Aboriginal Community late in the 70s installed the 'spherical reflector' TVRO antenna shown on our front cover (and page 7 - right). This C-band antenna, apparently used for early day reception from Intelsat at a time when the Australian ABC was relayed here, is a reminder that long before expensive, large, parabolic reflectors were available, pioneers in TVRO had an alternate technology. In fact, we still do.

A spherical antenna (more properly, a 'Swan Spherical Reflector') is similar to a parabolic but with some major advantages:

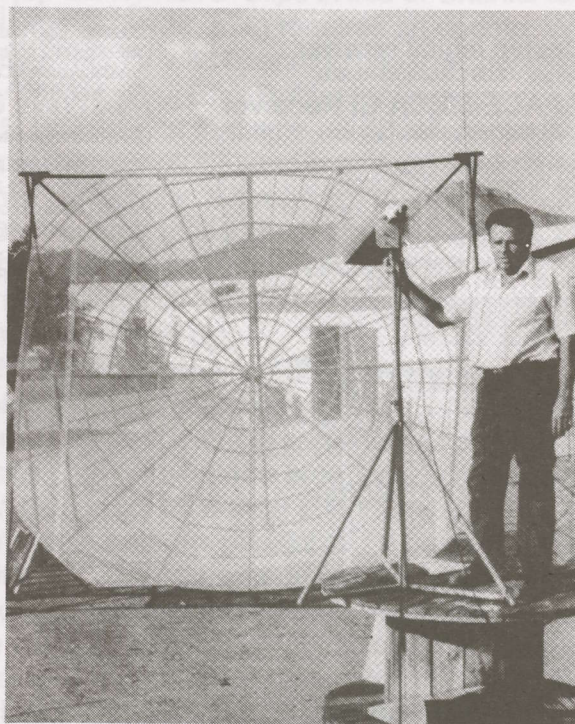
1/ Because the reflective surface is flatter (in both directions), it is capable of intercepting satellite signals over a much wider segment of the geostationary orbit - without moving the reflector - than a parabolic antenna.

2/ The reflective material is nominally 1/8" (3mm) opening aluminium window screening, available as a DIY material (in a roll) in most locales.

3/ The super structure supporting mechanism for the reflector is constructed from 1 1/2" 2.54cm to 1.5" 3.81 diameter steel or aluminium tubing. Alternately, it can be structurally sound wooden materials (such as Redwood or properly preserved and protected Cedar).

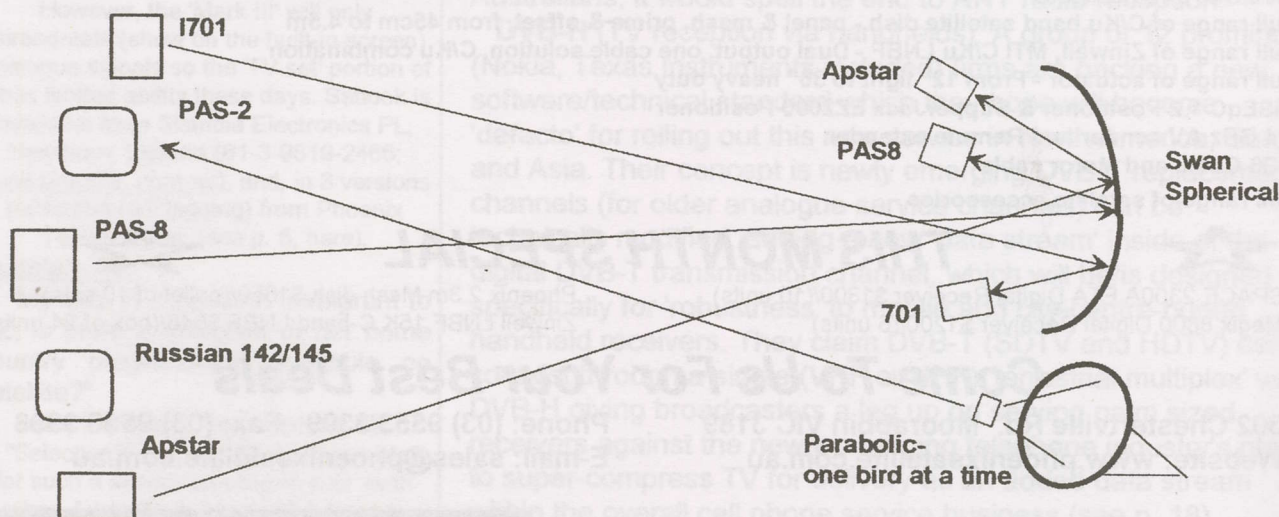
4/ The best part - if you have a satellite look angle from say As2 (100.5E) to I701 (180E), a single spherical reflector will allow you to have separate, independent, fixed feed reception from any 40 to 50 degree segment of this arc; say 100 - 150 degrees or 130-180 degrees.

The centre-line of the reflector will point, when installed, at the middle of your desired arc (call it 125E or in our second example, 155E). Because of the somewhat unique shape of the reflector surface, any satellite within the 'look window'



The inventor (Oliver Swan) and his original multi-sat spherical. Thousands (and thousands) were home built by enthusiasts from 1979 onward using common hand tools and DIY store materials.

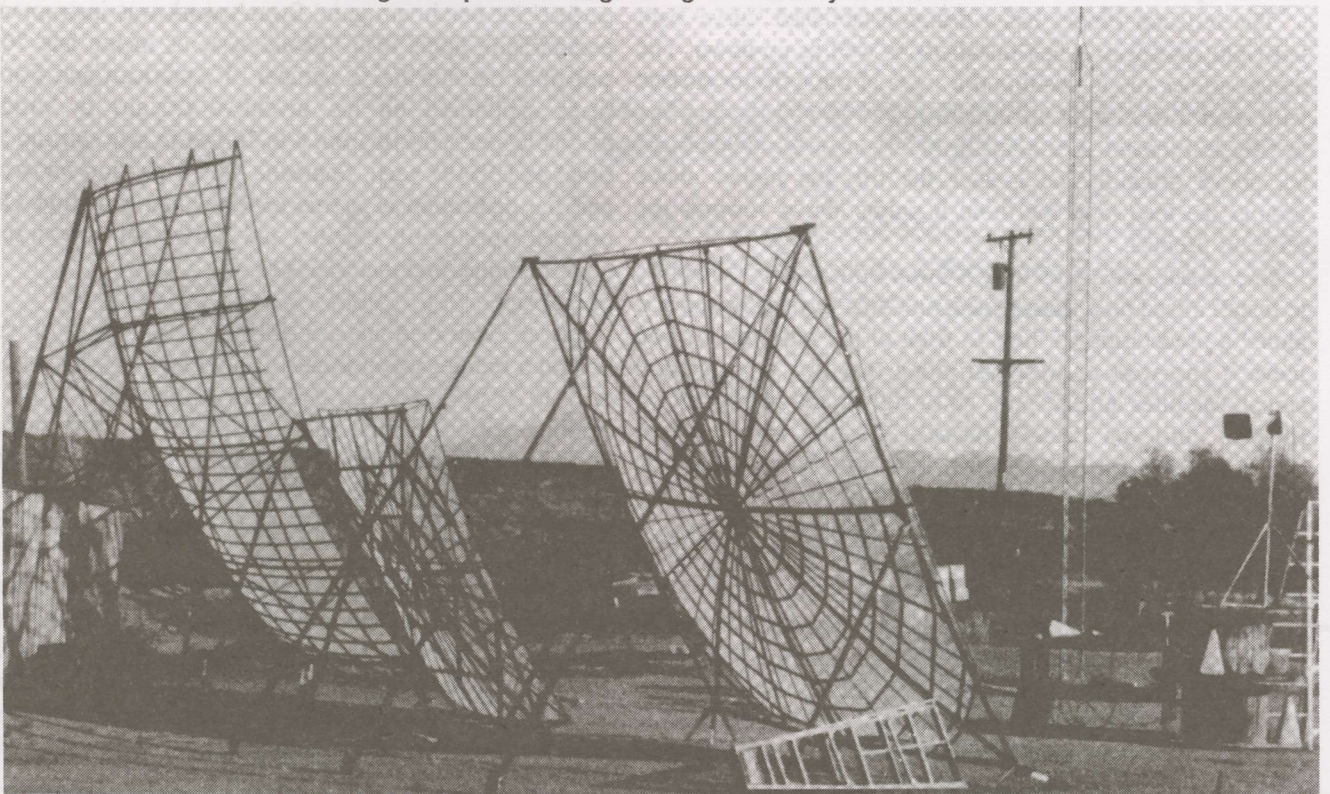
will be 'collected' by the reflector surface, and then reflected to the feed location. The neat part: For each satellite incoming angle, there is one and only one location where the feed gathers in maximum signal. If there are six satellites in your 'window, six separate feeds, all full time 'hot' can be installed. See diagram below.





All that remains of Swan-based Spherical at Kowanyama Aboriginal Community (15.5S, 141.75E), Australia. The 'net gain' of a ten footer (this appears to be more like 20 feet!) on individual satellites would be in the region of a prime-focus 8 footer; a 14 footer the gain-equivalent of a prime-focus 12 footer. Higher performance, cheap!

Poppa Spherical, Baby spherical, Mamma spherical each using modification of original 14 footer (page 6) prototype version. The builder can adjust the reflector surface parameters to suit a wide range of 'bird angles' up to 50 degrees spread through the geostationary orbit belt.



Properly constructed, the Swan Spherical provides only slightly less gain than a full size parabolic antenna. Only, the parabolic has to be motor driven and sweep across the Clarke Orbit Belt rather precisely to capture satellite signals whereas the Swan is stationary and 'switching satellites' is as simple as switch-selecting a separate dedicated feed.

Other advantages

A parabolic dish cries out, "I am a satellite TV antenna" whereas a Swan Spherical could easily be labelled, "a solar hot water system" or "electrical bug zapper" or even a "project I will get around to finishing - someday!" In other words, it can be 'disguised' as something that it is not, thereby attracting less sticky-beak neighbour reaction. It is possible that a sizeable 'Swan Spherical' could be installed in a suburban backyard up to 12, even 14 feet, in 'size' and attract virtually no complaints or reaction from normally anti-antenna neighbours.

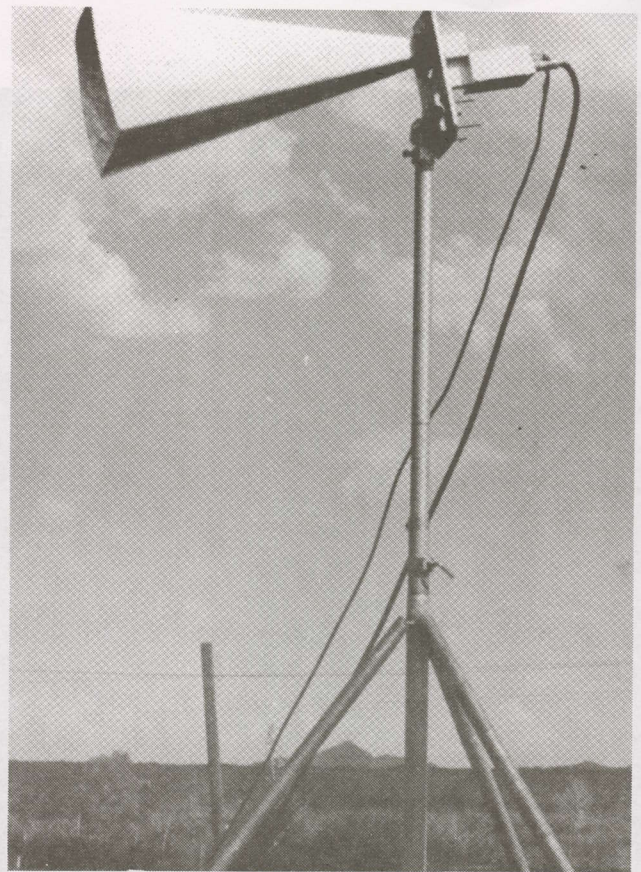
It is ground mounted (yes, it could go on a roof but why would you do such a thing!), and it uses between \$50 and \$75 in DIY materials for each 'foot' of size (i.e. a 14 footer should come in for materials at around \$700-\$1000). The 1/8"/3mm opening size aluminium reflective material is adequate for C-band' Ku would require material with a maximum opening in the region of 1.5mm.

The feed horn is unique (remember that a feed must be designed to 'match' the curvature of the dish surface and this curvature is not anything like a standard parabolic curve; the feed must conform to the unique curvature). However, the feed is self-constructed from 26 gauge zinc plated steel, it begins as a flat sheet laid out according to detailed plans (1), and is cut and bent to the form that you see here (right). The front of the feed, pointing to the reflector surface, is the wide bit; the feed 'tapers' to a narrow end that mates with a self-made zinc plated steel 'waveguide flange' which in turn allows you to bolt the LNB directly to the feed proper. The zinc plated steel is soldered after bending to retain its design shape and the 'waveguide flange' is in turn soldered to the narrow tapered end of the feedhorn (illustration, p. 32).

The reflector proper has a design-established 'curve' both left-right (east-west when installed) as well as up-down. The mount allows you to position the angle of the reflector surface with respect to straight up and down (zero degrees inclination or tilt) and that in turn affects where your feed antenna will be, above ground. The greater the tilt, the higher above ground the feed (and the more it points 'down' towards the reflector proper).

One of the neat tricks with a Swan Spherical is the ability to install a feed on a short tripod, and then physically 'move it along' a predetermined 'line' in front of the reflector. As you move it east-west or west-east along that line of maximum signal, satellites appear, peak up in signal, and then go down in level until you reach a physical location with the feed where the next satellite appears. Each satellite will have its own, unique, physical hot spot in front of the tilted reflector and it is because of this characteristic that you are able to install two or more feeds, position each for maximum signal from a single satellite, run separate RG6 lines inside to the receiver equipment, and 'switching lines' change satellites; all without moving anything outside.

Spherical antennas are available in the commercial realm for Ku band (see SatFACTS #109, p. 22) and what they do is basically what the Swan Spherical first did in 1978. A solid



The feeds are created from 26 gauge zinc plated steel following a detailed drawing and set of instructions in 'Swan Spherical Manual' (1). Feed attaches to LNB using plate attached to narrow end of feed; all home brew!

aluminium spherical, designed for 3-4-5 or even 6 separate (Ku band) satellites, is at best a compromise from the gain you would anticipate from a single parabola of similar physical size. What Oliver Swan did, quite uniquely, is provide a legacy of 'alignment tools' - simplistic DIY pieces of metal, spring loaded gadgets, that go with a C-band aluminium screening version and then 'tune the reflector surface' for maximum gain. Swan's work was instrumental in popularising home dish C-band systems in the late 70s and well into the 80s and a number of American and Canadian firms capitalised on his inventive designs by producing assemble-yourself-kits from 8 to 20 feet in size starting (at the time) as US\$495 each. Someone with a passion for accuracy and the dedication of a true experimenter will find Oliver's original work highly detailed and easily adaptable to modern day techniques and materials (1).

Post Script

Oliver Swan died unexpectedly in December 1979, leaving behind a rich legacy in innovative antenna designs stretching back to 1950 (the world's first 'Log Antenna' for TV is an example, followed by the first 'Logi' - Log + Yagi combined). He most enduring legacy was this: He could do what others spent thousands of dollars to do for hundreds of dollars. And his designs usually worked better than the higher-priced versions.

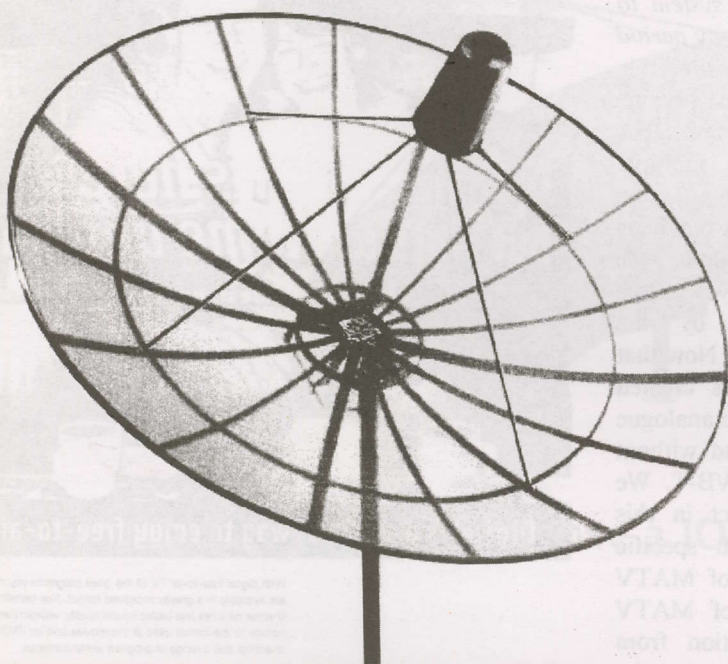
1/ 'The Swan Spherical TVRO Antenna', manual, is one of 25 original and complete 'Reference Works' found in Bob Cooper's 'TV Reception Addendum' CD available to SatFACTS readers (see p. 32, here). Also in same addendum, Nelson Ethier's 13 foot DIY parabolic manual. Anyone with shop tools and a 'desire' can duplicate either antenna at home.



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MATV/Master Antenna System Design is challenged by addition of digital terrestrial

If you believe commissioning of SMATV/MATV systems has been 'difficult' in the past, read the following:

"The contractor shall maintain the complete system to specifications, without charge, for an agreed warranty period (typically 12 months from the date of the commissioning)".

The world of multiple outlet MATV systems just became significantly more complex, if the recommendations of DBA (Digital Broadcasting Australia) are followed by multiple outlet facilities throughout Australia. Here's the story.

Although SatFACTS has been reporting technical problems with MATV systems carrying DVB-T services (along side pre-existing analogue services), for more than 2 years, this technical issue has largely been ignored by the creators/providers of terrestrial digital in Australia. Now that has changed - as thousands of MATV systems created decades or more ago to handle the locally available analogue services have been required to quite suddenly and without technical warning add the off-air reception of DVB-T. We said there were problems here; we were correct in this assessment. Now the DBA has come out with specific guidelines which they are urging all installers of MATV systems, and more importantly, all operators of MATV systems, to employ as the nation-wide transition from analogue to digital terrestrial matures. The following are the 'hot spots' identified by the DBA.

- 1/ Wrong DVB-T signal levels to individual sets connected to MATV systems.
- 2/ Amplifier derating calculation and equipment set-up errors (creating signal 'mixing' or 'intermodulation distortion')
- 3/ Improper selection of cable type or use of poor quality cable
- 4/ Mechanically unsound cable connectors or correct connectors poorly installed
- 5/ DVB-T installations created without supporting technical performance verification are not acceptable (i.e. BER and carrier to noise records are both required)
- 6/ Inadequate digital 'margin' (reference system failure) as measured at initial amplifier input, amplifier output and then at any (randomly chosen) (TV set) system outlets.
- 7/ Demodulation of DVB-T channels, then remodulating to analogue channels for continued reception on existing analogue only receivers is not acceptable (to DBA).
- 8/ Rechanneling of digital channel (multiplexes) while still in the DVB-T format (i.e. channel conversion) is also not acceptable.

What the DBA is attempting to do is create a set of documents that will become 'models' for 'Tender Requests' as the owners of existing MATV systems come to realise that they have some major dollars to spend upgrading older analogue-era distribution systems.

Shortcuts and pitfalls

If you owned a motel or other facility servicing some quantity of television sets through an analogue era reticulation system, and were faced with an expensive digital



More at: www.dba.org.au

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With digital free-to-air TV, all the great programs you now enjoy are available in a greatly improved format. Key benefits include sharper pictures and better sound quality, widescreen images (similar to the format used at the movies and for DVDs), extra channels and a range of program enhancements.

Many existing communal or Master Antenna Television (MATV) systems in Australian home units & apartment blocks will need to be upgraded to accommodate digital free-to-air TV. The level of upgrading required will vary depending on the existing system.

Make sure you can enjoy digital free-to-air TV now and into the future.

Get free information about the solutions at
www.dba.org.au/homeunits



DBA (Digital Broadcasting Australia) is trade association created by DVB-T telecasters to collect and disseminate consumer and trade information which will facilitate the conversion to digital in Australia.

upgrading, how long might you hesitate if an installation firm suggested the following?

1) If you add DVB-T signals in their DVB-T format to your system, your existing system will require new amplifiers, possibly new cable and fittings. And that is *cost one*.

2) But if your system only has analogue era receivers connected, why bother to do this? If you add DVB-T, then you will also be forced to replace existing analogue only receivers with digital receivers. Replacing all receivers with digital is '*cost two*' and this cost will make '*cost one*' seem insignificant.

3) Why not install DVB-T receivers only at the 'headend', take the baseband (video + audio) from the STB and feed it into a modulator? All existing analogue services (ABC, SBS, 7Net, 9Net and Net10) would be replaced with DVB-T received but remodulated to analogue channels on the system, thereby allowing continued use (perhaps for a decade or more into the future) of existing analogue TV sets.

This approach would create the higher quality benefits of digital without the necessity "at this time" to rebuild the

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existing distribution system and also replace the existing analogue receivers. The logic here is sound but the DBA does not accept it in their recommendations. They say:

"In these circumstances the Body Corporate or Managing Agent needs to be aware that if a broadcaster changes its digital signal (which may be likely), the digital receivers may need to be readjusted - a tedious process if this is a daily occurrence."

Here the DBA has created a defence against remodulation of digital to analogue with something less than the full truth. Why should they care?

First, they are the 'broadcasters' and with their DVB-T license there is built-in the eventual ability to transmit two or more separate program streams (such as one in HDTV, one on SDTV) simultaneously. A STB in the headend would be tuned to only one of these streams, and any TV set connected to the system after the STB would be limited to receiving only the stream which the box provides.

Second, the DBA has sponsored participation from virtually all of the STB and DVB-ready TV set suppliers in Australia. This latter group is only interested in the ultimate replacement of every analogue TV receiver in Australia with a digital model. By creating an 'intermediate step' where digital comes into the distribution system headend but analogue goes out, all of the receivers connected to that system will have no incentive to upgrade to digital. Obviously, all members of DBA have their own personal interests to protect and literature they produce will reflect this reality.

There are four options here (below). #1 is a head-in-the-sand ("I will believe it when they turn off the

analogue transmitters!") choice. Good, bad or indifferent, the eventual mandatory switchoff of analogue will be a political, not a business decision and nobody can second guess next year's political reverberations. #2 is a half-way house

DATE OF INSPECTION:			
BUILDING ADDRESS:			
BUILDING MANAGEMENT CONTACT DETAILS:			
DESCRIPTION OF BUILDING			
Number of dwelling units, apartments, townhouses	Number of floors	Approx. age of building (<5 yrs, 5-10 yrs, 10-20 yrs, >20 yrs)	
Does building have any heritage restrictions?	Public(housing development), private, investment, owner/occupiers		
TYPE OF DISTRIBUTION SYSTEM			
Does existing MATV system, if less than 5 years old, appear to generally comply with AS/NZS 1367-2000?	If yes, is Section 2 Safety adhered to as to safety earthing and AC isolation of outlets?	Does building have a lightning protection system installed?	
Are any FTA analog channels translated and, if so, to which channels?			
Does the building have a Pay TV service? If so, how is the service received (cable, satellite) and who is the provider?			If via satellite, does SMATV system combine terrestrial free to air services?
TYPE OF ANTENNA - Provide the data's for each existing antenna:			
Antenna	1	2 (if applicable)	3 (if applicable)
Description of Type - (UHF, VHF, Wideband, Single band)			
Polarity			
Channel coverage			
Likely age of antenna			
TYPE OF HEADEND			
Master Head amplifier (if used) or Pre-amplifier (if used)	Passive equalisers (if used)	Fixed channelised amplifiers with equalisers	
Frequency agile channelised amplifier	Fixed channel converters	Launch amplifier (multiband or wideband)	
Final active device specified maximum output level, if available			
FREE TO AIR DISTRIBUTION SYSTEM COMPONENTS			
Type of cable used for trunk, branch, spur (RG59, RG6, RG11, air spaced)	Shielding employed in cable above (single, dual, tri, quad) if determinable	Style of splitters and taps (screw and saddle, F)	
Type of cable used to outlet (RG59, RG6, RG11, air spaced)	Shielding employed in cable above (single, dual, tri, quad) if determinable	Type of connection on rear of outlets (screw and saddle, PAL, F, etc)	
Type of outlet (PAL, F, etc)	Type of equalisers (if any)	Type of inter-stage amplifiers without equalisers (if any)	
Type of inter-stage amplifiers with equalisers (if any)	Specified maximum output level of inter-stage amplifiers, if available		

Side one of two page 'Assessment' form - MATV systems

The MATV 'Road to Digital' Options

- 1/ Do nothing.** Leave the existing analogue-only system in place until the analogue transmitters actually close down (variously forecast from 2008 onward).
- 2/ Disconnect the system** from the reception aerial, take out the existing 'all band' headend amplifier, install DVB-T STBs to create baseband (video + audio), reticulate digital reception to PAL format analogue modulators placing each DVB-T decoded digital service on its pre-existing analogue system channel (7 analogue becomes 7-digital reticulated to analogue, etc.); the off-air DVB-T signals 'stop' at the headend and the distribution system continues (perhaps without modification except at the headend) to be 'analogue'.
- 3/ Redesign the distribution system** to carry analogue plus digital, upgrade the full distribution system to DVB-T standards, allowing existing sets to be used in analogue format, new sets to be used in digital format.
- 4/ Redesign as in 3-above,** eliminate all existing analogue aerial inputs (requires extensive filtering), reticulate DVB-T through STBs to PAL modulators, combining reticulated DVB-T digital for the off-air channels with DVB-T off-air (more - extensive filtering) thereby producing digital reception quality on analogue channels, optional DVB-T tuning on appropriate STBs or digital-ready sets connected to system.

September 2005: Bob Cooper will simultaneously release two epic books tracing the development of satellite television.

Excerpt: *"VIDEO Pirates: Hiding inside your TV set*

Robert Coleman lived in Traveler's Rest, South Carolina, operated a junk yard that pretended it was a second-hand auto parts store, and with absolutely no formal training of any kind created on his kitchen table circuits and satellite parts that even Stanford Professor Tay Howard had to admit were leading edge stuff.

As a 'junk man' his mind set was 'cheap, cheaper and cheapest' with his entire life devoted to digging through other people's trash looking for something he could modify into an item of increased value. Ten years my senior, I liked him immensely from the moment I drove into his tall pine tree shaded yard to create some videotape of his work.

Robert was pure-southern, perhaps a generation or two too late to have his own Negro slaves but of the same mind set as his ancestors, none the less. He lived in a 'good old boy' world where if he needed something done which was perhaps just a tiny bit shady, his cousin (the local sheriff) would oblige. His friends had names like 'Billy-Bob', 'Old Yeller', 'Possum Butt' and I'm not talking about his pets.

"This is as surplus dish", he began with the video camera rolling. For the benefit of my non-ham-radio enthusiast viewers, I asked him to explain 'surplus'.

"Well, you know, somebody didn't want it and I did. It was 'surplus' to their needs and I gave them \$10 for it". I smiled. "I'd say you got a bargain", fingering the large parabolic shape behind us which stood many feet taller than Bob or I. Similar, even identical, dishes were commanding prices in the region of \$3,000 in the non-surplus 'commercial' world.

"There wasn't no mount with it" he continued, "so I worked out where it had to point to see the Westar satellite, and propped it up against this here pine tree".

I knew at this point 99% of the viewers were either rolling on the floor and holding their sides in raucous laughter, or, were sure they misunderstood his thick southern accent. He was only warming up.

"This thing here is the fine tuning for the receiver", he went on, pointing at a second hand (well, surplus) white drinking straw protruding from a hole in a strange circular copper pipe.

"And what does it do?" I smiled, knowing I was being set up.

"Well, if the signal drifts and needs to be repeaked, I push on this to make the picture come back".

For twenty memorable and precious minutes, the 3/4" tape deck recorded one of the most unusual insights into microwave technology to ever appear on a television screen. Coleman knew none of the big words, he had adapted some early 50s era terminology invented for that thrice-removed early-decade exploration by ham radio operators into 'ultra short-waves', to suit his description of this amazing collection of 'surplus parts' which - as we all could plainly see on the 'surplus' TV set propped up on an empty wooden barrel behind us - was somehow intercepting and reproducing PBS service from the Westar satellite.

"How much money do you think you have invested in this?" I asked at one point.

"Maybe \$100" he answered with a sheepish grin. "But that signal generator over there", pointing to a World War Two era grey metal contraption covered with knobs and meters, "it cost me \$50. I think I paid too much for it". The 'signal generator' was one of his 'secret tools' to make the TVRO system work as we stood in the sun, streaming through his 100 foot tall pine tree forest, in the spring of 1979.

Coleman's pictures were hardly in the same class as mine at home back in Oklahoma, and even by Taylor Howard's standard, they were not great. But there it was on the screen - satellite TV with sound, and if you lived in Left Testicle, Wyoming and had no TV at all, you would find the reception very acceptable.

And most important, it dispelled the myth that satellite TV had to be expensive.

More than 500 pages of 'first person' (because Coop was there) recounting of the people, the events, the human foibles that allowed today's satellite industry to develop. This is not your typical perspective; the good, the bad and the incredible all share a common spotlight!

500 'Autographed, Personalised, Numbered' pre-release copies, on DVD/CD, will be available in September. These 'Collector Edition' priceless treasures will precede a hard copy version edition to be available in late-fourth quarter 2005. The price per pre-release copy is US\$100 including airmail shipment world-wide. A US distributor has already spoken for 250 of the 500 copies; an order form for those remaining (only 500 will be issued) will first appear in the June 2005 edition of SatFACTS.

Also to be released September 2005: **"TELEVISION: The technology that changed our lives"**. The first documented story of how money grubbing shady characters have controlled television programming distribution from the dawn of the industry in 1935. More than a decade of skilful research reveals that viewers, from the launch of BBC-TV, have been subsidising 'video thievery'. Details in June SatFACTS.

Meanwhile - Foxtel Digital Comes to the MDU Party

For each technical problem presented by adding DVB-T to an existing MATV system, there are a dozen more unique to adding Foxtel (or Austar, Sky NZ) to 'MDU' (multiple dwelling unit) systems. MATV systems, by design, carry a VHF + UHF spectrum bandwidth of typically 45 to 862 MHz (45-806 MHz in NZ). Foxtel/Austar/Sky NZ, to be reticulated through a system, require the bandwidth be expanded to include 950 - 2150 MHz. This requires a total replacement of pre-existing coaxial cables (especially if RG-59 family), amplifiers, splitters, taps, connectors (no PAL socket family fittings, anyplace - not even on wall plate outlets), even jumper/flylead cables connecting from wallplates to receivers (virtually all are constructed from RG59 cable; a definite mistake between 950 and 2150 MHz). Rule one: Only "F" connectors. Rule two: Only quad-shield (that means four layers of shielding) cable; see below. Rule three: The system signal level 'balance' (starting at the lowest frequency such as 45/46 MHz going upwards to the highest - near 2,150 MHz) must be very carefully 'sloped' to conform to the offset of cable losses as the transmission frequency increases. Rule four: Analogue terrestrial signals require the strongest levels for be reproduced properly (typically in region of +60 dBuV to +80 dBuV), terrestrial digitals require the next lowest level set (typically +56 dBuV to +74 dBuV) followed closely by satellite digitals (typically +48 dBuV to +60 dBuV). A digital STB (whether terrestrial or satellite) will function badly when it receives either too little signals (tiling) or too much signal (frozen frames, STB lock-up). A digital signal that has been 'over-amplified' (too much amplifier gain) will also exhibit tiling, a subset of 'compression' within the amplifier stage. Analogue signals, the 'dinosaurs' in this MDU equation, will with as few as five channels, consume approximately 45% of the total amplifier output capability; system design becomes must easier to manage if the analogue channel carriers are totally eliminated in the planning stage (a mark in favour of digital-only). Foxtel has avoided MDU connections but throughout May convened seminars to "launch new MDU satellite specification and commissioning technical standards" (info from 1300 136 488).

approach; it says, "You can have the quality reception benefits for DVB-T quickly and with a modest expense." For the cost of five STBs and five modulators, ABC, SBS and the three commercial networks can be delivered to distribution connected receivers in receiver-friendly analogue. The benefits of this can be real.

A high percentage of the technical problems associated with providing DVB-T through existing MATV systems are associated with the co-existence of both analogue and digital being co-processed. If you rebuild the distribution system based upon having five analogue and five digital signals today, what happens when the analogues are switched off? The answer is, with the analogues gone, you are likely to find the 'old fashioned' analogue-era distribution system will function either just fine without rebuilding, or, the rebuilding

steps will be a fraction of what they would be if done, *today*. Getting rid of the five powerful analogue carriers will make a significant system design and performance difference.

So there is a valid point to be made for 'waiting' - for not rushing to build a digital + analogue distribution system that could be required for a period as short as 3 years (2008 being a commonly mentioned analogue shut-down date). Plus, for the MATV system operator, there is the equally strong argument that rushing out to purchase DVB-T compatible sets (or STBs for motel-hotel clients) may not be in their best capital expenditure interests. STB's have price dropped from A\$600+ to as little as A\$100, and while this may be a plateau for some time to come, DVB-T television sets still have a long ways to go before they approach analogue sets commonly employed in motel and hotel environments. By

The Rules: Compliance requires the following (to be a successful tenderer)

Overall: MATV system design: AS/NZS 1367-2000 (includes earthing protection requirements)

Cable and distribution components: AS 3815-1996 (wall box/surface mounting requirements included; "a minimum of 150mm tail required for cable termination at outlets".)

Antennas: AS 1417.1 and AS 1417.2 covers antenna construction, installation, performance criteria ("All antennas should be installed at least one wavelength above the roof to minimise parasitic effects, and should incorporate a low VSWR matching balun".)

Headend equipment: AS/NZS 1367-2000, Section 6. "Allowance for sufficient cooling to heat sensitive modules is to be made, eg, headend is not to be located within the roof cavity".)

Distribution amplifiers: AS/NZS 1367-2000, Section 4. "Suitable derating of the output level of single and cascaded amplifiers, allowing for the present number of five/six analogue and seven digital channels".

Distribution components: AS/NZS 1367-2000, Section 5 ("passive equipment").

Coaxial Cable: AS/NZS 1367-2000, Section 5.7. "Cable loss shall not exceed 20 dB at 862 MHz per 100m; screening using quad-shield cable shall be not less than 95 dB as: Inner shield - 100% aluminium shield, bonded to dielectric; 2nd shield - not less than 60% coverage, aluminium braid; 3rd shield - 100% coverage aluminium foil; 4th shield - not less than 40% coverage aluminium braid".

Coaxial connectors: AS/NZS 1367-2000, Section 5.8. "Twist on connectors will not be employed', PAL connectors only used on devices requiring such a connection (TV, VCR). Hex or compression attachment only (not with separate crimping ring on F type, not screw/braid clamp for PAL".)

Outlets: AS/NZS 1367-200, Section 5.4. "All outlets to be F connector rear, F or PAL at front. PAL to be used only for terrestrial free-to-air services in 45-862 MHz range (not in satellite STB installations".)

Flyleads: AS/NZS 1367-2000, Section 5.3. "Cable to be RG6 Quad Shield; for uses below 862 MHz-optional RG 59 Quad Shield (bonded only)".

DBA Recommended Signal Levels - at input to TV or VCR (end of flylead)

TV signal levels, based upon DBA recommendations, should be as follows:

For 20 or fewer channels within distribution system: Digital range from 56 dBuV (DVB-T) to 74 dBuV; analogue 66 dBuV to 80 dBuV

For more than 20 channels within distribution system: Digital range from 56 dBuV (DVB-T) to 70 dBuV; Analogue 66 dBuV to 77 dBuV

DBA Recommended BER at input and output of headend and cascaded amplifiers

<2.0E-6

DBA Recommended BER (DVB-T) at wall outlets (not inclusive of Satellite)

<2.0E-6

Digital Margins

Headend and amplifiers: "Margin to failure" greater than 9 dB (failure varies from 15 to 20 dB C/NR) reference BER of 2.0E-6

At wall outlets: "Margin failure" greater than 9 dB (failure varies from 15 to 20 dB C/NR) reference BER 2.0E-6.

simply waiting out another couple of years, set replacement should go down by 50% capital cost; a strong incentive to wait. By the way, placing STBs in motel and hotel environments is universally a bad decision. STBs have to be 'driven' by their internal menu and when you expect one or two night residents to master that system (even with instruction) during a brief stay, the odds are against you. Those who have tried this report, to a user, *"We spend more time reprogramming the damned things than we do cleaning rooms!"* You are so advised.

Of course there is an opposite side to this debate. The obvious arguments come from those who broadcast in DVB-T and more specifically those who produce and distribute TV sets capable of functioning in this mode. "It is the latest and the best" is one such argument. Unfortunately, people who reside in a motel or hotel for a brief stay will only manage to screw up the on screen menu programming options leaving the system operator with the same, *"We spend more time"* problem as with STBs.

MATV systems located in condo developments and multiple unit apartments present a different PR problem. If the system does not reticulate DVB-T in its pure off-air form, nobody living in the 400 living unit complex will be in the market for a STB or a DVB-T television set (no DVB-T signal at their wall plate pretty well eliminates that option). Is

that sufficient reason to completely rebuild a MATV system so as to offer, parallel, both DVB-T and analogue, until analogue actually leaves the air? Each facility will have to make that decision as a pure business judgement. If the answer is "Yes - go ahead and do it", how does the facility owner/manager justify that when analogue does switch off, he (or she) is left with a two-purpose system that will at analogue switch off only process a single category of TV signals? That's a tough one, and as the cost of rebuilding for three years or so of parallel analogue + digital service may well be four to ten times as much as one of the interim solutions, it is unlikely that many facility managers or owners will opt for that decision.

Synopsis

The fear here is that the DBA, flexing its muscles, ends up planting their self-serving 'rules' in places where, by lack of options, building owners/managers accept their text as gospel.

Any competent, experienced MATV system installer, designer or maintenance technician will spot numerous 'not in the real world' mistakes in their document. What might happen, as a result, is that only incompetent installers tackle jobs built around the DBA 'suggested format' (ignorance of the real world being one form of bliss). SatFACTS encourages feedback on this issue - skyking@clear.net.nz.

DBA Prescribed 'Conditions of Completion' for Tenderer

"Key system points" will be used to verify system (performance). All recorded data to be provided to system owner/manager in written form at completion of system installation, as verification the system meets or exceeds the original tender "promises".

Headend: Signal levels - all off-air; input to processor or channel processors; 'grouped' (frequency multiplexed) output of all channels as presented to distribution system including modulator channels; input and output of all (cascaded) amplifiers, all channels. Carrier to noise for all off-air channels, all channel processors, all modulators, at output of (frequency multiplexed) output to distribution system.

Margins: Off-air channels as received; output to distribution system.

All (system cascade) amplifiers: All channels, input and output levels for each amplifier location; all channels, input and output C/NR for all channels; BER (DVB-T channels) at input and output of all amplifiers.

All (system) distribution components; at line splitters: Signal level for lowest and highest level channels (identifying by frequency and service each such channel).

All (system) (wallplate) outlets: Signal levels (all channels), BER (digital channels), margin of digital channels (a calculation that follows actual signal measurement taking into account threshold level of STB or 'nominal' TV receiver equipped with DVB-T).

Installer shall supply complete 'as built' system diagram identifying by location, part number, each component of the system.

Note: Verification (whether conducted by building owner/management or by independent consultant) not to be greater than +/- 1 dB from installer recorded values (*a pretty good trick* when most meters are incapable of +/- 1 dB repeat measurements - not to speak of differences between measurement meters even if of the same manufacture and model number!). Our view: The person who wrote this language has spent far too long living behind a desk.



IX Digital Satellite Receiver

- DVB, MPEG-2 compliant
- 4000 channel capacity
- Extended EPG
- Program reservation through EPG
- Teletext decoding
- 8-event timer
- Parental control
- Renameable 8 favorite groups
- 4 sorting modes
- DiSEqC 1.2 USALS
- Picture-in-graphics
- Automatic NIT scan
- Multi language support OSD
- Software upgrading
- Unit-to-unit data transfer

IF SECTION

Input Frequency Range : 950 - 2150 MHz
 Input Frequency Level : -65 dBm - -25 dBm
 Noise Figure : 12 dB Max.
 Input Impedance : 75 ohm
 I.F. Bandwidth : 36 MHz
 Input Return Loss : -8 dBm
 Tuning Step Size : 125 KHz
 Demodulation : Shaped QPSK
 Symbol Rate : 2.45 Mbauds
 FEC Rates : 1/2, 2/3, 3/4, 5/6, 7/8, AUTO

LNB SECTION

Connector : F-Type - Loop-through
 Power : 400 mA Max.
 Polarization : Horizontal : DC 16-19 V
 Vertical : DC 11-14 V
 Band (H/L) Selection : 22 KHz On/Off
 DiSEqC 1.2 USALS : 64 Universal LNB Control

SYSTEM RESOURCES

Processor : 32 bit (80 MHz)
 SDRAM : 8 Mbyte
 FLASH : 2 Mbyte
 EEPROM : 32 Kbyte

VIDEO SECTION

Decoding : MPEG-2 & MPEG-1 Compatible
 Compression Technique : Main Profile, Main level
 Format : PAL (NTSC)
 Frame Rate : 25 (30) Hz
 Aspect Ratio : 4:3, 16:9
 Active Pixel : 720 x 576, 720 x 480
 Output Impedance : 75 ohm
 Composite Output Level : 1Vp-p±0.07Vp-p (75 ohm load)
 S/N Unweighted : 57 dB Min.
 Frequency Response : 3 dB Max. (0.5-5.0 MHz)
 Data Rate : Up to 15 Mb/s

AUDIO SECTION

Compression Technique : MPEG-1, 2 Layer 1 & 2
 Sound Mode : Dual (Main/Sub), Stereo
 Frequency Response : 2.0 dB - 20 Hz to 20 KHz
 Output Impedance : 600 ohm unbalanced
 Total Harmonic Distortion : 1% Max. - 40 Hz ~ 20 KHz

CONNECTORS SECTION

A/V Out : RCA x 3
 RF Out : IEC Male
 Aerial In : IEC Female
 Service Port : RS-232C (115 Kbps Max.)

MODULATOR SECTION

Output: PAL G//K CH 21-69 UHF

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Satellites play a part - minor - in go-with-you TV delivery

Just when you have perhaps gotten over the failed promises of your local telephone company ("digital cell phone coverage will be the equivalent or better of analogue" was a popular theme two years ago), and it appeared that telephone, having discovered a huge pot of gold at the end of the text messaging format would stick to communications, - watch out! Here comes the newest, latest, assault on the way folks you count as your customers can get TV. Well, they call it TV although chances are it will be some years before the latest audience attractive network TV shows appear.

As encryption compression algorithms have 'improved' (definition of an *improved* compression technique: "More data in less bandwidth"), and cell phone designers have created ever smaller, less energy hungry devices, there is a merging of technology with human desires. Or at least major telephone companies world-wide hope this is the case.

In the most simplistic format, your cell phone with a 1.8 to 3" LCD, or other technology screen, allows virtually any video formatted data stream to be scanned across the display. Phones with games, photo-texting (or photo capture) add-ons have done this for a couple of years. The only function not previously built into the handheld phone was the ability to receive (capture) TV transmissions and display them channel by channel (service by service) on the same screen.

Yet 3-4-5" handheld colour TV receivers have been available for nearly ten years and while their physical size is

typically larger than the nominal cell phone, size is determined largely by the LCD screen display requirements, not any need for 'storage space' to stuff into the actual TV receiver. This particular family of handheld TV sets function over the VHF and UHF bands, collecting their microvolts of signal from local relatively high power analogue TV transmitters. To date, no handheld digital (DVB-T) TV set has appeared in the market.

Nokia has displayed, if not yet offered for sale, a cell phone with a built-in capability to also tune-in the local VHF and UHF analogue TV services. Interest in it has not been high, perhaps largely because consumers tend to be more intrigued with rushing out to purchase some 'new technology' rather than recycled technology. Taking photos with your cell phone, saving them on a file, and sharing them (at some transmission cost) with a distant similarly equipped cell phone is far more 'exciting' at the consumer level than merely having 'TV-to-Go'. And that, perhaps, identifies the number one marketing challenge if somehow the mass market is to become enamoured with TV on the cell phone. "TV? I have that at home - why do I want it on the go?"

Entry level

First the obvious. If the telephone circuits will be the delivery mode for TV-to-Go, then your use of bandwidth (from wherever the TV enters the system, up to your cell phone receiver) will cost money; bandwidth consumed = s

The rush to offer video/audio channels via cell phones

Always on a search for "the killer application" (the 'one' service that turns the financial rewards of being a telephone company upside down as 'text messaging' has done), the next big revolution is to supply television to you via your cell phone - whether you want it or not! And look who's "coming to the party". Telstra, Optus and Vodafone all plan to introduce 3G (third generation) level packages including 'TV in your pocket' (how having it in your pocket will allow you to watch it - there - is not explained!). Likely charges? Uncertain, but in range from \$5 per month upwards (\$5 gets you 'video clips', not complete programmes). Optus currently offers an interim half-step version they call 2.5G (ABC and SBS Sydney 'video streaming'); Telstra, which owns sponsorship rights to Rugby and Union, plans to offer per-event to your cell phone service - for a fee, of course. Video via Internet (and cell phones, with 3G deployed) is driving growth of 'the web'. A study shows video 'peer-to-peer' (P2P) file trading of video during 2004 outpaced growth of music P2P. Video files are 'huge' by comparison to music and other files; movies often go to 600MB and in Asia 30% of ISP traffic in December was video P2P. One software program, designed to expedite moving video P2P (BitTorrent) has been downloaded by more than 22 million users world-wide; a measure of the popularity of large-scale video file sharing. Currently, P2P traffic consumes as much as 50% of all Internet 'time' on a world-wide basis. Standards? Good luck. Qualcomm's proprietary software (FLO, used by Japan and Korean MBS; see p. 20) was first but now faces stiff competition from 12 firms agreeing on open standard DVB-H. Radio broadcasting, until now largely ignoring web distribution, has recently awoken to the huge market available, especially in the 10-25 year age group. Accordingly, the two largest group radio station owner/operators in the USA (Infinity and Clear Channel) have introduced web linking of some (soon to be most if not all) of their combined 2,000 radio stations. In Australia, www.radio2.com.au, WorldAudio Radio 2, is challenging existing broadcast radio stations by pushing web distribution as an alternative to broadcast radio (including satellite delivered programming). One survey found 40,000 'regular listeners' to the web service in western Sydney alone). One aspect is certain; as 2G becomes 2.5G becomes 3G, the Nokias of the world are loving it as each new generation of mobile cell phone software sends millions streaming to their dealers looking for an upgrade to the latest, newest, tricks-added cell phone. There is an end to this - but not before 2010. The first major stepping stone to video-success is likely to be 2006's World Soccer Games in Germany, an event large enough to propel 3G video delivery world-wide overnight. For now, Fox News Channel has just launched on Sprint TV; where Rupert steps, others are bound to follow.

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Switches

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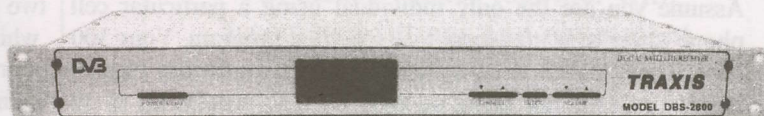


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MBSat: Unique of all DBS satellites

Sitting at 144E, MBSat-1 was custom built by Space Systems/Loral to provide a two country (Japan + Korea) footprint of sufficient power to allow handheld (or vehicle installed) miniature signal processing (reception) systems to have access to any of the following: Through two x 25 MHz 2.6 GHz transponders (one boresighted on Korea, one on Japan), "more than 50 channels of audio, video, and data services (some Japanese sources say 'more than 60 data channels')". Reception devices can be located in vehicles (trains, boats, trucks, cars), on board aeroplanes serving domestic Japanese/Korean or Japan-Korea routes, can be handheld PDA (using Compact Flash Tuners), PC (using PC card tuners), cellular phones, home portables; see Toshiba MTV-S10 and Sharp 4E-MB1. For locations where satellite LOS (line of sight) is impossible (tunnels, city centres, interior to high rise buildings) MBSat has already constructed 4,800 'terrestrial repeaters/gap fillers' (in Korea; in Japan, quantity not announced) and an additional 4,000 are planned over the next 12 months. The intent is to make the reception 'seamless' when a user moves from a vehicle or street side into a building (or tunnel). The (terrestrial) repeaters are fed by two additional transponders (not required for direct reception by consumers) and operate on a different frequency from the direct-to-earth normal customer boresights. PC-card tuners are also available (MBT0102A). 30 radio service channels include, uniquely, satellite FM radio fed links from the USA (San Francisco, Los Angeles). Data channels will include news, sports and weather reports. Between 7 and 14 video channels are also scheduled, with Japan service featuring Japanese sourced programming, Korean service from that country. Japan will also have a 'Premium' movie and sports channel available. Monthly fees are in the range of A\$25 per month for the 'basic service' with four different 'package channel plans' on offer. MBSat uses 2.6 GHz to reach handhelds; 12GHz for "gap filler" feeds. At the 4,800+ terrestrial sites, 12 GHz is frequency converted to 2.6 GHz Ku allowing receivers to continue working inside of shielded areas; pretty clever.

dollars spent multiplied by the time you are using it. Broadcasters use what is essentially free-to-them VHF or UHF spectrum to deliver their fare; telephone delivery requires mega-kilometres of expensive fibre optics, dozens or thousands of fibre modems, and one or more links of 'RF spectrum space' within the final-mile delivery cell phone transmitter (site). You will pay for this - perhaps someday 'advertisers' will pay a part of that cost, but not initially.

How much are you willing to pay to have this evening's Rugby match on a 3" screen glued just in front of your nose? That much? Not enough. Multiply it by 2 to 5 times. Early fees, like any new technology, will make home subscription to Foxtel or Austar or Sky NZ seem virtually free. Think in terms of \$5 to \$10 for each hour of reception delivered, initially.

The delivery mechanism is a part of the cost problem. Assume you are the only individual using a particular cell phone tower to want access to a specified program. Your 300 kbps Rugby match delivery will be using bandwidth (space) which could, if not being so used for TV, handle up to 50 telephone conversations. So for the two hour match, your reception is consuming equivalent telephone chargeable space of $50 \times 2 = 100$ hourly billing units. Which makes \$10 for a match seem like a bargain.

If two (or more) individuals connected to the network through the same cell phone site ask for ("subscribe to") the same programme, could they not share a single programme data stream? In theory, they could because if say ten folks using that particular site all wanted the same programme and each required 300 kbps of space, the 3,000 kbps consumed for all ten would support 500 simultaneous (replacement) telephone links. And at some point, with too many ordering TV, the bandwidth capacity of the cell phone site becomes overloaded - no more bandwidth remaining for normal cell phone / text connections. Obviously there are some technology challenges here.

So when two or more request a download of the same programme event during the same time period, now the individual users become shared users and the event being telecast is being 'broadcast' to all simultaneously, using only a single data stream. That saves bandwidth, reduces the cost

per user (an actual case where volume means lower costs), but changes the nature of what telephone is doing; a 'private line connection' becomes a 'party line connection'.

This is but one challenge facing the telecoms who for whatever reason suddenly believe the next pot of gold will be found at the end of the TV programming rainbow. Many are suggesting telephone should stay out of this particular mine field.

There is another approach, taken by a pioneering Korean/Japanese firm. Design a special purpose satellite which is from the ground up intended only for 'mobile broadcasting' to cell phone like receiver devices. Their first in the world entry into this unexplored technology launched in early May. Here's how it works.

The cell phone you own is replaced with a new customised version that compacts into a single hand held miniature unit two separate functions; number one is the standard cell phone while number two is a satellite receiving system. Yes, held in your hand. It makes and receives normal cell function transmissions, and at the user's option, switches from cell phone to satellite TV receiver. Only this particular satellite television receiver is of no use to receive normal C/Ku/Ka band transmissions, digital or analogue. It only works with the built-to-order satellite created as a delivery mechanism for this service.

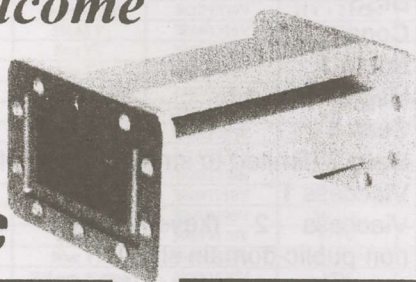
What makes the system unique is the software that compresses normal TV broadcast bandwidths to microscopic replicas of normal satellite TV service. Full motion video ends up being approximately 1/10th the bandwidth of 'normal' satellite video - a 'trick' they believe they can do successfully largely because the viewing screen is itself approximately 1/10th the dimensions of a standard TV receiver screen. Small screen means artefacts (blemishes) are 'lost' in the physical compression of the image; what the eye cannot discern is for all practical purposes 'gone' from the display.

What makes the system too unique for 'rapid rollout' is the technology that requires special satellites designed for this purpose. There is a huge monetary gamble here, as the Japanese/Korean designers and their backers are now working out.

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The dawn of mobile TV

So, in Korea at least, there are two 'mobile TV' options. One uses the traditional telephone company cell phone model, complete with all of its existing (if temporary) bandwidth constraints and high user fees, while the second (launched this month), called DMB (Digital Multimedia Broadcasting), uses a custom satellite. Cell Phone links are limited, today, by bandwidth constraints pre-existing in the terrestrial system. DMB is limited by the time element; if it takes off like a shot (early indicators are not that good), before it can encircle the globe to Europe, North America and

Australia-NZ, they will have to build customised satellites, launch them, and turn on the services; a 2-4 year time lead that could by its very limits kill the project before it can be rolled out elsewhere. Think of DMB as Beta format tape (Sony) and Cell Phone 3G as VHS. One can roll out immediately, grow immediately, capture the market within 12 months. The other, while possibly better technically and more economical at least today, needs a 2-4 year head start. Which, unfortunately for the Japan/Korean backers, it may not have. The winner? Stay tuned.

A good thing gets better-

Strong's 'X-Digital' Receiver has longevity

Software remains the name of the game for those engaged in design, manufacture and distribution of FTA and quasi-FTA satellite receivers. Variants of MPEG2 (such as 4:2:2 framing) require matching software or the image display ends up being garbage. So too the inner working structure of software designed to function with one (or more) variants of conditional access. No single manufacturer has a corner on the market although each strives to make their receiver as 'universal' in application as possible.

Software developers are an ingenious lot but unfortunately they often lose interest in their project once a particular plateau has been passed. This means long term support, if dependent upon a single individual, often disappears at about the same time as his (or her) technology becomes well known and popular.

On-going attention to 'after market support' also often wanes when a particular receiver format experiences a sales slump as a particular market is saturated. All of this makes investment in a 'CAS Support' STB a gamble; if initial support from the factory wanes, and no talented field users pick up the challenge and continue development work on new formats, eventually the receiver line is discontinued leaving users with a relic. The original Nokia D-Box mods are a prime example of this full sequence (as recently as three years ago selling for \$1,000 per STB when 'fully loaded', they are impossible to even 'give away' today).

The current software version of the X Digital is 1.73 (May 2005). What it does that the preceding software versions did not do is 'automatically' access a service without user intervention of key codes or 'start numbers', and, provide more trouble free initial card authorisation in the Irdeto 2 CA system. When the appropriate transponder and services have been found and loaded, version 1.73 software treats 'protected' channels as if they were fully FTA; enter the memory number and there it is, making it perhaps more 'consumer friendly' than any previously available software. Like any decent design of FTA-Plus STB, software upgrades are RS232 supported and new software can be loaded as it becomes available by anyone with modest computer skills. With continued support of the manufacturer and industry, this one should continue to be a favourite.

X Digital Satellite Receiver capabilities

"X CAS support" simply means the receiver designer has managed to build-in software which will, without the addition of a programmer smartcard, allow either fully automatic or RCU "key number instructions" to decode a service. And there are flavours to this capability; some services which require user key insertion rely upon web posting of keys (which may or may not be changed without notice), making accessing such services (even with the X Digital receiver) a hit and miss affair. As of May 7, here is the X Digital capabilities.

Without a smart card:

Alphacrypt
Betacrypt
BISS
Conax
Irdeto 1
Nagravision 1
Seca 1
Seca 2 (limited to small number of channels only)
Viaccess 1
Viaccess 2 (keys posted only on secure, non-public-domain sites)

At the same time, if you have an appropriate programmer authorised smart card, the X Digital will function properly as if it were a programmer supplied STB. This includes the following formats.

With programmer issued smart card

Alphacrypt
Betacrypt
Conax CA55 (Nordic version not supported)
Cryptoworks
Irdeto 1 & 2
Nagravision 1 (Aladin/Nagravision 2 not supported)
Seca 1 & 2
Viaccess 1 & 2

Updates including support for X Digital box users appears on the web at

<http://www.geocities.com/funtechpatch2004/>

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 MAY, 2005

Bird	Service	RF/IF &Polarity	# Program Channels	FEC	Msym
Thom3/78.5	SkyChAust	3695/1455H	up to 3	3/4	5(000)
	ANT Greece	3672/1478H	1 TV	3/4	13(333)
	Korean Central	3665/1485H	1	2/3	3(367)
	TARBS ME mux	3640/1510H	12TV, 12 radio	2/3	28(066)
	Ch Nepal	3626/1524V	1	3/4	15(556)
	Mahar mux	3600/1550H	11TV, 1 rad	3/4	26(667)
	SE asia Mux	3569/1581H	2+ TV	3/4	12(500)
	RR Sat mux	3551/1600H	8TV,10 radio	3/4	13(333)
	JAIN TV	3538/1612V	1TV	3/4	3(300)
	PTV1 +	3521/1629V	1TV, 1 radio	3/4	3(333)
	FTA Mux	3520/1630H	12TV, 12 radio	3/4	29(800)
	TVK Cambodia	3448/1702H	1TV	1/2	6(312)
	TARBS/Th5	3480/1670H	12 TV+radio	2/3	26(667)
	KCTV/Korea	3424/1726H	1TV	3/4	3(366)
	Thai Global	3425/1725V	up to ??	2/3	27(500)
	ETV mux	4005/1145V	6+ TV	3/4	27(000)
	Hyd Dig 2E	3910/1240V	1	3/4	5(000)
	Kairali TV	3699/1451V	1	3/4	3(184)
	Indian mux	3643/1507V	3	3/4	19(531)
	ETV Mux#2	3485/1665V	4+TV	3/4	27(000)
NSS6/95E	Sky Bangla	3430/1720V	1TV	3/4	6(000)
	Ant Pac (Greek)	11.104H-Australia	1 TV	3/4	2(800)
	Guangdong TV	4075/1075H	1TV + radio	3/4	6(000)
	Euro Bougt	4000/1150H	6TV, 21r	3/4	28(125)
	Reuters News	3905/1245H	1TV	3/4	4(000)
	WorldNet	3880/1270H	4+/28radio	1/2	20(400)
	APTN Asia	3799/1351H	1	3/4	5(632)
	Reuters/Sing.	3775/1375H	1	3/4	5(631)
	APTN Asia#2	3705/1445H	1	3/4	4(166)
	Macau MUX	4148/1002V	5TV	3/4	11(850)
	Dubai MUX	4020/11430V	4+, radio	3/4	27(500)
	Fashion TV	3796/1354V	1	3/4	2(626)
	Trace TV	3792/1358V	1	3/4	2(400)
	BYU-TV	3767/1383V	1 + 20 audio	1/2	6(525)
	3-ch miniMUX	3752/1398V	up to 3	3/4	5(640)
	Saudi TV1	3660/1490V	7+/tests	3/4	27(500)
	CETV digital	3680/1470H	1+ TV	3/4	26(670)
	Zee bouquet	3700/1450V	10TV	3/4	27(500)
	Ch News Asia	3706/1444H	1TV (+)	3/4	6(000)
	Azio TV	3716/1434H	1TV (+)	3/4	7(000)
As3S/105.5E	3 ch MUX	3723/1427V	3TV	3/4	6(500)
	SAB TV	3743/2407V	1TV	3/4	3(300)
	AAJ-TV	3750/1400V	1TV	3/4	2(820)
	Arirang TV	3755/1395V	1	7/8	4(418)
	Now TV +	3760/1390H	up to 10TV	7/8	26(000)
	Star TV	3780/1370V	7(+TV	3/4	28(100)
	GXTV	3806/1344V	1TV + 3 radio	3/4	4(420)
	Shaanxi TV	3813/1337V	1TV + 2 radio	3/4	4(420)
	Anhui TV	3820/1330V	1TV + 2 radio	3/4	4(420)
	Jiangsu TV	3827/1330V	1TV + 2 radio	3/4	4(420)
	HLITV	3834/1316V	1TV	3/4	4(420)
	Star TV	3840/1310H	7(+TV	7/8	26(850)
	Star TV	3860/1290V	5(+TV	3/4	27(500)
	Abudhabi MUX	3880/1270H	8+TV, 10Radio	3/4	27(500)
	Dragon TV	3886/1264V	1 TV	3/4	4(800)
	Shandong	3895/1255V	1TV + 6 radio	3/4	6(813)
	Jilin TV	3914/1236V	1TV + 1 radio	3/4	4(420)
	Star TV	3920/1230H	4+ TV	7/8	26(850)
	Star TV	3940/1210V	6(+TV	7/8	26(850)
	CNN	3960/1190H	8(+TV	3/4	27(500)
	StarTV	3980/1170V	6+TV	3/4	28(100)
	Star TV	4000/1150H	8(+TV	7/8	26(850)
	Sahara digital	4020/1130V	8TV	3/4	27(250)
	Hubei TV	4035/1115H	1TV + 2 radio	3/4	4(420)
	Tianjin TV	4046/1104V	1TV + radio	3/4	5(950)
	Sichuan TV	4051/1099H	1TV + 1 radio	3/4	4(420)
	Qinghai TV	4067/1083H	1TV + 2 radio	3/4	4(420)
	Hunan TV	4082/1068H	1TV + 1 radio	3/4	4(420)
	Pakistani TV	4091/1059V	5TV, 1 radio	3/4	13(333)
	Sun TV	4095/1055H	1	3/4	5(554)
Cak1/107.5	TVB8 Mux	4110/1040H	3	3/4	13(650)
	Indus News	4115/1035V	1	3/4	3(222)
	CCTV bqt	4129/1021H	4(+TV	3/4	13(240)
	Zee Bqt #2	4140/1010V	8(+TV	3/4	27(500)
	Henan TV	4166/984V	1TV + 4 radio	3/4	4(420)
	Fujian TV	4180/970V	1TV + 2 radio	3/4	4(420)
	Jiangxi TV	4187/963V	1TV + 2 radio	3/4	4(420)
	Liaoning TV	4194/956V	1TV + 2 radio	3/4	4(420)
	Indovision (S-band)	2.535, 2.565, 2.595, 2.625, 2.655	33(+TV	7/8	20(000)
	T'Kom/108E	IndoBqt	3460/1690H	up to 6	3/4
C2M/113E	TPI	4185/965V	1	3/4	6(700)
	TVE Asia-Africa	4160/990H	1	3/4	5(632)
	Anteve	4144/1006V	1	3/4	6(510)
	Kabelvision Mux	4080/1070H	7+ TV	7/8	28(125)
	Indostar	4074/1076V	1	3/4	6(500)
	Satelindo	3935/1215H	1	3/4	6(700)
	Bali TV	3926/1224H	1	3/4	4(208)
	Indo MUX	3880/1270H	3+ TV	7/8	28(121)

Receivers and Errata
CA (#1, 3); FTA audio #2 (dm)
Late July 04: room for more (FTA)
Global footprint; changes 02/03
CA + 2 FTA(A1TV, IRB3)
New 03/03; FTA
Thai + Indian services; FTA
MRTV3, MRTV (DM)
3TV, Sradio inc. Hellas TV Greece FTA
PIDs 4132/4133
frequency change
Aug 04: 5TV, 1 ra FTA (India)
FTA
3FTA: TV5, VTV4, ATN Bangla
Not 24 hour, FTA?
FTA (reaches SE Australia)
Several ETV now here; wide beam
SCPC, OK E. Aust. wide beam
SCPC, OK E. Aust wide beam
corrections 12/02
Several new ETV here; Asia beam
New - November 2002
(still) FTA 11-04; was 11.083H
July 04: FTA
FTA TV + radio; RAI PID changes April 2005
Was 3923H; sometimes FTA
FTA; multiple audio services V2360, A2320
Sometimes FTA; also 3895Vt
FTA & CA
FTA and CA - NASA reports included
5 chs TV, FTA, some tests
FTA, EuroSport PID change (1213/1313) June
FTA as of May 1, 2003
new here Dec 2004; Euro-French music videos
Increased coverage; great variety audio chs(03-05)
Sun-TV, Surya TV, KTV (FTA)
FTA MCP; Yemen, MBC EUROsport tests
replaces analogue same freq; V33, A32
Now SECA 2 CA (10-04)
New September 2003; English + V1160, A1120
Parallel to 3640Hz analogue (due to cease)
Conax CA, 3 ch movie mux; Dec 2004
New April 2005; English, urdu
FTA SCPC; New PIDs V3601, A3606 June 2003
CA + FTA
NDS CA (Pace DVS211, Zenith)
Guangxi TV; was As2
Was As2
Was As2
Was As2
Was As2; HeiLong
NDS CA (Pace DVS211, Zenith)
NDS CA (Pace DVS211, Zenith)
New April 2004: link to Optus B3 Globecast
Shanghai
Apparently Mongolia; was As2
Was As2
Star Sports Asia (+), FTA NTSC; V514, A670 (10-04)
NDS CA as above; may NOT be operational
PowVu CA; new SR Apr 29; CNN radio FTA
NDS CA; Star News India FTA VPID 514, APID 648
NDS CA w/ 4(Chinese) FTA
New Sr September
Was As2
new December 2005
Was As2
Was As2
Was As2
Was As2
new Sr, channels, Nov 2003
"History Channel" - SCPC, some English
MATV Chinese movies FTA +CA; new Sr 05-04
Hindi (+ "Plus")
moved from 4115
Now SECA 2 CA (10-04); 1 occ. FTA (varies)
Was As2
Was As2
Was As2
Was As2
NDS CA using RCA/Thomson,
Pace IRDs; 2.535 has 2 FTA
also 3586H/17.500, 3496H/19.615
FTA SCPC; NT/NC only
New August 2003
change from 4055V; FTA SCPC
also try 3500H, 27.000, 3/4; strong NZ
FTA (new 06-03); V2201, A2202
test card - only - reported
FTA, may not be active full time
FTA: Sr change 01/03; erratic

Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
	Brunei/Sing	3733/1417H	1TV	3/4	6(,000)
	SCTV	3726/1424V	1TV	3/4	6(,620)
	RCTI	3473/1677H	2	3/4	8(,000)
As4/122E	Aust DTH test	12.453V	2	3/4	20(,000)
	CCTV internal	4100/1050V	6	3/4	27(,500)
Jc3/128	Miracle Net	3996/1154V	3 up to 6	5/6	22(,000)
	Asian bqt	3960/1190V	up to 8	7/8	30(,000)
T18/138	Tests	3460/1690V	1	3/4	30(,000)
	LTV Laos	3804/1346V	1		
Jc2A 154	BYU-TV	3915/1245V	1+ 20 languages	3/4	4(,166) (?)
MeasSs2	Astro Mux	11.602H	up to 17TV	3/4	41(,500)
	VTV MUX	11.522V	3 TV	3/4	9(,766)
B3/152	AuroraBiz	12.407V	4 TV, 10 radio	2/3	30(,000)
	Occ feeds	12.445H	1TV	3/4	6(,666)
	Globecast 2	12.525V	13 TV, 8 radio	2/3	30(,000)
	Globecast (feeds)	12.550-555V	1TV	3/4 & 2/3	6(,110/670)
	Globecast	12.564V/T13	2+ TV	2/3	30(,000)
	UBI/tests	12.613H/T14L	11+TV	3/4	22(,500)
	UBI/tests	12.640H/T14U	11+TV	3/4	22(,500)
	Globecast 1	12.658V/T7	14TV, 15 radio	2/3	30(,000)
	UBI/tests	12.674H/T15L	11+TV	3/4	22(,500)
	UBI/tests	12.701H/T15U	11+TV	3/4	22(,500)
	WA ABC	12.702V	1 TV, 1 radio	7/8	14(,288)
	WA SBS	12.720V	4TV, 2 radio	5/6	12(,600)
	WA GWN/WIN	12.738V	2TV	7/8	14(,295)
C1/156E	Optus test bed	12.288V/T1L	6+ (ABC) TV	1/2	28(,650)
	Aurora	12.324V/T1U	4+ (ABC) TV	1/2	24(,450)
	Pay TV	12.365V/T2	11TV, 2 radio	3/4	27(,800)
	Aurora Home	12.407V/T3	5TV, 13 radio	2/3	30(,000)
	Pay-TV	12.447V/T4	5TV, 4 data	3/4	27(,800)
	Pay TV (test)	12.487V/T5	3+ TV, data	3/4	27(,800)
	Aurora 2	12.527V/T6	7TV, 20 radio	3/4	30(,000)
	Pay-TV	12.567V/T7	10 TV	3/4	27(,800)
	Pay-TV	12.607V/T8	10 TV	3/4	27(,800)
	Pay-TV	12.647V/T9	10 TV	3/4	27(,800)
	Pay-TV tests	12.720V/T10	6+TV, data	3/4	27(,800)
	Austar	12.305H/T11	6TV, 24 data	3/4	30(,000)
	Pay-TV	12.358H/T12	10 TV	3/4	27(,800)
	Pay-TV	12.398H/T13	10 TV	3/4	27(,800)
	Pay-TV	12.438H/T14	6TV, 3 data	3/4	27(,800)
	Pay-TV	12.478H/T15	10 TV	3/4	27(,800)
	Pay-TV	12.518H/T16	10 TV	3/4	27(,800)
	Pay-TV	12.558H/T17	10 TV	3/4	27(,800)
	Pay TV	12.598H/T18	TV	3/4	27(,800)
	Pay-TV	12.638H/T19	10TV, 30 radio	3/4	27(,800)
	Pay TV	12.688H/T20	11TV	3/4	27(,800)
B1/160	7 Central DTH	12.354H	1TV	3/4	5(,100)
	Occ. feeds	12.380H	1 TV - *	3/4	6(,111)
	Occ. feeds	12.384V	1 TV - *	3/4	6(,111)
	Net 7 service	12.397H	1	3/4	7(,200)
	Imparja mux	12.379H	2TV + 8 radio	3/4	5(,424)
	7 digital feeds	12.379H	1TV	3/4	7(,200)
	Feeds to NZ	12.411V	1 TV	3/4	6(,111)
	SBS Mux	12.420H	3+ TV, 2+ radio	5/6	12(,600)
	TVNZ DTH	12.456V	5+TV	3/4	22(,500)
	TVNZ Tests	12.483V	up to 10TV	3/4	22(,500)
	Sky NZ	12.519/546V	7TV/7TV	3/4	22(,500)
	Sky NZ	12.581/608V	6TV/6TV	3/4	22(,500)
	Sky NZ	12.644/671V	9TV	3/4	22(,500)
	ABC HDTV	12.610H	5TV	7/8	14(,3288)
	Sky NZ	12.707/734V	8+TV	3/4	22(,500)
P8/166E	ABS-CBN	12.575H	4+TV, 4+ radio	2/3	13(,845)
	JEDI/TVB	12.686H	11+ TV	3/4	28(,126)
	ABC A-P	4180/970H	2TV, 2 radio	3/4	27(,500)
	Disney Pac	4140/1010H	typ 6 TV	5/6	28(,125)
	Taiwanese MUX	4080/1070H	12+ TV	5/6	30(,000)
	NHK Joho	4060/1090H	7TV, 1 radio	3/4	26(,470)
	FOX Mux	4040/1110V	up to 5TV	7/8	26(,470)
	NET +	4121/1029V	1 TV	3/4	4(,774)
	ESPN USA	4020/1130H	8+TV, data	3/4	26(,470)
	Discovery	3980/1170H	8 typ.	3/4	27(,690)
	CalBqt/Pas8	3940/1210H	up to 3+ FTA	7/8	27(,690)
	CNBC HK	3900/1250H	up to 7TV	3/4	27(,500)
	FilipinoMUX	3880/1270V	up to 8TV+radio	5/6	28(,694)
	TaiwanBqt	3860/1290H	12TV + 30 r	5/6	28(,000)
	CCTV Mux	3829/1321H	up to 4 + 1 radio	3/4	13(,240)
	TVBS-N	3836/1314V	1FTA, 4+ CA	3/4	22(,000)
	EMTV PNG	3808/1342V	1 + 2 radio	3/4	5(,632)
	CNNI	3780/1370H	3, up to 5 TV	3/4	25(,000)
	Discovery Asia	3764/1386V	Up to 6 TV	3/4	19(,850)
	MTV	3740/1410H	8	2/3	27(,500)
P2/169E	WA Mux Pr	12.281V	3+ TV, radio	2/3	27(,500)
	Ariang TV	12.401V	1TV	3/4	4(,400)
	ABS-CBN	12.575H	4TV, 2 radio		13(,845)
	Test mux	12.716H	6+ TV	3/4	30(,800)
	TARBS feeds	4090V/1060V	9TV + radio	3/4	21(,000)
	BBC SCPC	3986/1164H	1TV	1/2	5(,700)
	Middle East	3836/1314V	4 typ	3/4	13(,331)

Receivers and Errata

FTA ; Singapore 23hrs, Brunei 1 hr; Brunei V1200
was on 4048V; New Caledonia, parts of Australia
FTA SCPC; Australia, New Caledonia, some English
Planned Aust DTH; VTV CA, other FTA (10-04)
Irdeto 2 + TVSN occ. FTA; also, 4020V
PowerVu; some FTA (Ch. 1 & 3)
CA & FTA NTSC; Japan, Taiwan
also try 3660Vt, Sr 30,000, 3/4; some occ. FTA
VPID 512, APID 4112
Strong NZ & Australia; may now be 1/2, 6.525
Aust East beam - 3 FTA + 14 CA
WA only? Skew path, intended Asia
differs from 12.407 C1; **tune ch FTA; NZ+Au**
Net 10, V8 racing; also 12.452H, same parameters
NZ + Au, FTA Mcript CA
occ feeds, NZ + Au; recently 12.553V
New Feb 05; TVN racing, TV Korea, Telepace
High performance beam; not NZ
High performance beam; not NZ
NZ + Au (Mcript, PowVu capable)
High performance beam; not NZ
High performance beam; not NZ
ABC WA tests, FTA
SBS, radio tests WA FTA
Irdeto V2 CA, tests (GWN, WIN)
Widescreen ABC service feeds x 6 + tests; 29 radio
CA, replaced Aurora T10 1 February 2005; 19 radio
Tests; SBS-NDS CA, others FTA when here
NZ (90cm) + Australia (**Only svs left on NZ; C1**)
Australia NA only (leakage to Norfolk, New Cal)
Australia NA only (leakage); 9-Net x 3 widescreen
Arrow radio (still here), tone FTA
Pay-per-view movies; CA
Pay-per-view movies; CA
Pay-per-view movies; CA
currently repeating 12.438Hz, TVSN FTA
Austar inter, **Expo FTA**
NDS CA + Mcript; CA
CA, subscriptions available Australia, Norfolk
Sky News active; 'Help x 2' FTA
CA, subscriptions avail Au, Nrlk; **TVSN FTA**
CA, subscriptions available Australia, Norfolk
"Home"CA, subscription available Australia, Nrlk
CA, subscriptions available Australia, Norfolk
CA, subscription available Australia, Norfolk
CA, subscription available Australia, Norfolk
Central beam; originally to feed Tasmania
* - plus 12.451H, 12.460H
* - plus 12.293V, 12.402V, 12.411V
Full schedule less commercials - links; may be CA
PIDs vary; also try 12.360, 12.370
occ. digital feeds; typ fla
Often NTSC; USA-Australia-NZ
Also 12.437H, 12.456H same params; HDTV+WS
FTA 7 channels (TVNZ x 4); +Maori_DW, CCTV9
Testing late Feb; possible FTA MUX coming?
NDS CA, subscription available NZ
NDS CA, subscription available NZ
NDS CA, subscription available NZ
also see 12.626, 643, 670, 688, & 706H
NDS CA, subscriptions available NZ
CA
June 2002-Irdeto-2 CA
Dateline west; also east PAS2, 3901V
PowVu CA
Tests - CA service announced
PowVu CA & FTA; subscription available
was PAS-2, previously 3992Vt, **feeds FTA**
NET25 + FTA; new PIDS April '03; reload
PowVu CA; ch 11 DCP-CCP bootload; audio FTA
PowVu/CA (some audio FTA)
PowVu CA & FTA (EWTN + CBS + TBN +)
NDS CA (6 channels); one test card occ FTA
Myx FTA V1960, A1920 + radio FTA
Mixed FTA & CA; STC gone (CA)
PowVu FTA, replaces PAS-2 svs
Difficult because of CCTV cross pole
PowVu CA
PowerVu; some audio FTA
PowerVu; Asian MUX; new parameters Nov '03
8 **MTV China FTA V289, A290**; rest CA
PowVu CA, WIN, ABC NT, SBS; status unknown
Test - may not stay permanently
Temp FTA; subs Aust 011-800-2270-0722
initially with 6 NTSC colour bars
Occ FTA (Chile +); BIG power reduction Nov 03
BBC World moved here January 2005
Irdeto 2 CA - subscriptions avail; Strong Tech

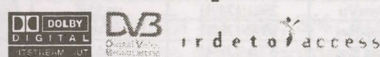
homecast eM200



Digital **Satellite** Receiver with 2 x CI slots.
and Irdeto 2.09 CI cam.



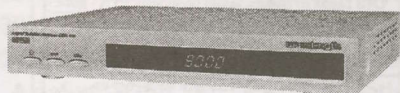
homecast eM150IR



Compact embedded Irdeto
Satellite receiver with 1 card slot.



wavelength DSR-103



FTA Compact Digital **Satellite** Receiver
With Modulator & SPDIF Coaxial output
Diseq1.2 and loop through connection.

wavelength DTR-279



FTA Compact Digital **Terrestrial** Receiver
SD Standard Definition Digital Terrestrial Receiver with
modulator, Wide Hot Key, Teletext & Logical Channel

homecast HT5000



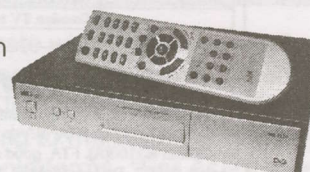
HD High Definition
Digital **Terrestrial**
Receiver with DVI
output.



homecast eM1150



SD Standard Definition
Digital **Terrestrial**
Receiver with
modulator.



Homecast Australia site for terrestrial receivers is at <http://www.homecast.net.au>

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Bird	Service	RF/IF & Polarity	# Program Channels	FEC	Msym
(PAS2/169E)	Adventists.tv	4040/1010H	1	2/3	5(900)
	Feeds	3868/1182H	1	2/3	6(620)
	Feeds	3939/1211H	2 (typ NTSC)	2/3	6(620)/7(498)
	Cal PowVu	3901/1249H	up to 8	3/4	30(800)
	HK bouquet	3850/1300H	up to 8	2/3	24(900)
	Korean Bgt	3771/1379H	1	3/4	6(510)
I704/174E	iPSTAR	12.619H	1	2/3	25(220)
	Tests-NZ beam	12.646H	1	3/4	22(418)
	RFO Poly	4027/1123R	1TV	3/4	4(566)
I701/180E	TNTV	11.060&11.514V	9	3/4	30(000)
	TVRFO	11.136V, 11.174V	6+TV, 3+ radio	3/4	23(149)
	Canal+Sat	11.610H	16TV, 1 radio	3/4	30(000)
	PBS	12.648HH	16TV possible	3/4	28(066)
	TVNZ/BBC	4186/964RHC	1	3/4	5(632)
	TVNZ	4178/972RHC	1	3/4	5(632)
	AFRTS DTS	4175/975L	3 TV, 3 radio	2/3	3(680)
	TVNZ/Aptn	4170/980RHC	1	3/4	5(632)
	Fiji Sky Pacific	4095/1055LHC	6TV + future radio	3/4	16(505)
	Fiji Sky Pacific	4055/1095LHC	6TV + future radio	3/4	16(505)
	TVNZ/feeds	4052/1098RHC	1	3/4	5(632)
	TVNZ feeds	4044/1106R	1	3/4	5(632)
	NZ Prime TV	4024/1126L	1	2/3	6(876)
	NBC to 7 Oz	3960/1190R	1	7/8	6(447)
	WorldNet	3886/1264R	1TV, 37 radio	3/4	25(000)
	Iearama	3772/1378L	1	3/4	4(566)
	NASA TV	3854/1296R	1 TV	3/4	2(000)
	NASA TV2	3859/1291R	1 TV	3/4	2(000)
	TVNZ	3846/1304R	1	3/4	5(632)
	NBA (Barker) Ch	3803/1347R	1	3/4	6(111)
	USA feeds	3749/1401R	4?	?	26(400)
NSS-S/177W	Pacific IP Data	3745/1405R	none-date	3/4	44(995)
	BYU-TV	4185/965R	1TV, 20+ audio	1/2	6(525)
	iPSTAR Tests	12.691V	9+ TV	5/6	17(600)
	Russian TV tests	12.774H	1 TV	3/4	3(470)

Receivers and Errata

New December 2003; 24/7 "Hope Chs."
FTA (occ sport); also try 3863, Sr6.100
FTA-typ NTSC-occ sport, live Shuttle
PowVu CA + FTA (ABC-A-P 'til 'early' 2005)
was 4148V; some FTA
Korean MUX, reload 12-04; new Sr
Tests, late May start; also 12.646H
Testing possible data links; June 2003
SE spot beam; was 4027LHC
east spot; 10TV + r each, vertical pol.
FTA 11.136 Tahitian beam, 11.174 west beam; 12/04
I+ FTA, MediaGd "2"; + 10.975 weaker
Testing Fiji region pay-TV (MDS) package (Oct '04)
DMV/NTL early vers. occ feeds, typ ca
DMV/NTL early vers., occ feeds, typ ca
'DTS Direct to Sailors; audio previously FTA - gone
DMV/NTL early vers. occ feeds, typically ca
Nagravision CA (> Feb 1, 2005) New PIDS
All now (including Fiji 1) CA; 7 Feb, 2005)
DMV/NTL early vers., occ feeds, typ ca
SCPC, mixed CA and FTA feeds
PowVu CA; Auckland net feeds
CA, Leitch encoded
New PIDS Dec 03 very strong NZ, Pacific
FTA SCPC; East Hemi Beam-Tahiti
24/7 live NASA - West Hemi beam (difficult!)
NASA supplemental
SCPC, mixed CA & FTA, feeds
NBA feeds - probably CA - new Nov 2003
16-QAM (not MPEG-2 compatible)
Data only but useful for dish alignment, top Sr check
Global beam - requires sizeable dish
CA Tests - Taiwan TV; data coming?? (NZ beam)
Tests - may not last (May 2005); NZ + beam

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

AV-COMM R3100. FTA, excellent sensitivity (review SF May 1998); new version Sept. '99. AV-COMM P/L, 61-2-9939-4377.
 AV-COMM Tiny Tot. FTA, 12Vdc operated, palm sized, low power consumption; review SF#120. Contact # above.
 AV-COMM R3100(A). FTA, good sensitivity, ease of use exc (review SF May 2002). See above contact.
 Coship 3188C. Review SF#107. Blind search FTA rcvr, works well. Available from Satlink NZ www.satlinknz.co.nz. (ONLY KNOWN DISTRIBUTOR IN WORLD)
 Divitone: "Left-handed" review SF#115; does "code key" entry. Available <http://www.satmax.ws>
 eMTECH eM-100B (FTA), eM-200B (FTA + Cbx2), eM210B (FTA + 2xCI + positioner); KanSat 61-7-5484 6246 (review SF#89)
 Fortec Star Lifetime. Two versions, both blind search, code-key programmable, one X 2 CI. Review SF#119. www.aDigitalLife.com
 Humax ICR1 5400 (Z). Embedded Irdeeto + 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available; new software avail 04-04, SF#76.
 Humax ICR1 5410 (Z). Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available; original importer Sciteq (www.sciteq.com.au).
 Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions; 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26)
 Hyundai HSS700. FTA, PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.
 Hyundai HSS800CI. FTA, Irdeeto (with CAM) + other CA systems, PowerVu, NTSC. Kristal Electronics, above; review SF#63.
 INNNOVIA IDS3088. Review SF#111. Blind search FTA receiver. High quality IRD; available Phoenix Technologies, and Satmax (<http://www.satmax.ws>).
 ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI Interface slot Irdeeto 1 & 2; review SF#109. Sciteq 61-8-9409-6677.
 MediaStar D7. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. 61-2-9618-5777
 MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. MediaStar Comm. Int. 61-2-9618-5777
 MediaStar D10. FTA and Irdeeto embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.
 MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
 Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. SF#95, p. 14.
 Nokia 9200/9500. When equipped with proper software, does Aurora, originally did pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)
 Pace DGT400/DVR500. Originally Galaxy (Now Foxtel+Austar). Irdeeto, some FTA with difficulty (Foxtel Australia 1300-380818). UECs replaced; Sept 18 (2003) "drop-dead" day; all were to have been "turned off" on that date (in fact, those with V1.13 CAMs may still be working; still does radio including CA, not TV).
 Pace "Worldbox" (DSR-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA; similar "Zenith" version (see SF#115, p. 15).
 Phoenix 111, 222. PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH (below)- 222; terminated
 Phoenix 333. FTA SCPC, MCPC, analogue + dish mover. Detailed SF review SF#51. SATECH 61-3-9553-3399.
 Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
 PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NIHK, CMT etc). For service only - call Scientific Atlanta 61-2-9452-3388. For revision model D9850, see Scientific Atlanta (below).
 PowTek. Blind Search Chinese sourced, field tests rate it highly. Source jason@aDigitalLife.com
 Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
 SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-2749); no longer available.)
 SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above); no longer available.
 SATWORK ST3618. Blind search FTA receiver. Fast search, problems, especially in "memory-filing" system; review SF#111. Available DMSi at tim@dmsiusa.com.
 SATWORK ST3688. Blind search, 3000+ ch memory, multi-format RF modulator; improved version 3618. Review SF#113; available DMSi (above).
 Scientific Atlanta D9223, D9234, D9225; Orig. PowerVu, superseded Dec 2003 by D9850. Commercial receiver, available TVO 61-2-9281-4481, John Martin
 Strong Technologies SRT2620. SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below).
 Strong SRT 4600. SCPC, MCPC, PowerVu; exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.
 Strong 4800. SCPC, MCPC, embedded Irdeeto+ CAM slots, does code-key with additional software, Aurora. Strong Technologies 61-3-8795-7990.
 Strong 4800 II. SCPC, MCPC CAM slots x2 for Aurora +, Zee, Canal +, code key with additional software. Strong Technologies (above); review SF#103.
 Strong 4890. SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSeqC 1.0, 1.2 (review SF#84), does code key with additional software; Strong Technologies, # above.
 UEC Atlas/Titan (1000). New July 2003, replacing DGT400 for Austar. No SCART, L-band loop; also available Rural Electronics 61-2-6361 3636.
 UEC642. Designed for Aurora (Irdeeto), approved by Optus; w/new software, C-band FTA; faulty P/S. Norsat 61-8-9451-8300.
 UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel, limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.
 UEC700/720. Single chip Irdeeto built-in design for Foxtel; unfriendly for FTA. Power supply problems, seldom sold to consumers; propensity to fall off back of trucks.
 Winersat DigiBox 200. C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ fax 64-9-814-9447; long term teletext problems (loses TT).
 "X" Digital. When modified with "aftermarket" Internet software, does Aurora and other V-1 CA without card; review SF#119. Strong Technologies (61-3-8795-7990).

Accessories:

Aurora smart cards. MYCRYPT (Irdeeto V2) cards now available (Jan 2005), Sciteq 61-8-9409-6677.
 PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4; pgm ch 11 and follow instructions (do not leave early!)
 PowerVu (Pacific) repair service: Cable & Sat Svcs. Darius West. 61-2-9792-1421 (Email darius@cases.net.au)

WITH THE OBSERVERS

AT PRESS DEADLINE

UBI B3 Macedonian MKT1 running again after leaving air 1 May. I-Sky-Net again (seldom lasts long) FTA Telstar 18 3460V; new mux 3540V, FTA initially, Sr 30.000, 3/4. ApStar 6 testing 142E, should be at real home 134E as you read this.

ApStar 6/142E: (Note: These reports from temporary testing location at 142E; to move to 134E by May 15-23 with Ku beam China tests May 23rd). "Unmodulated carriers 3600H, 3800H, 3840H". (Kana, Japan) "Test carriers 3900, 4020V". (BRichards, SA) "Strong carriers 3638H, 3677H, 3720H, 3760H, 4000H". (M, Melbourne)

AsiaSat 2/100.5E: "RAI International (within European Bouquet, 4.000H, Sr 28.125, 3/4) has been changing PIDs late April-early May: Try VPID 513, APID 644". (Italian viewer, SA) (Editor's note: Older receivers may not follow the PID changes and users will require manual re-entry to recapture this service when PIDs change.)

AsiaSat 3S/105.5E: "AAJ TV, English and Urdu, now on 3750Vt, Sr 2.820, 3/4; news, current affairs, entertainment". (Jacob)

InSat 2E/83E: "RR Sat promo FTA 4042Vt, Sr 8.000, 3/4, VPID 257, APID 513". (BRichards, SA) "Free XTV has launched 4042Vt, Sr 8.000, 7/8 CA with Viaccess and Irdeto 2". (BRichards, SA)

Intelsat 701/180E: "NASA's new multiple channel format includes 3859RHC, Sr 2.000, 3/4 signal which of course requires a power reduction in primary channel (3854 RHC; same digital parameters). Power sharing always drops levels of individual (SCPCs) within transponder; we have more channels but less power per service!" (CSutton, NZ)

NSS-5/177W: "Russian 'MYTV Plus' and 'Perviy kanal Vsemirnaya setj' is a test to determine if there are sufficient Russian émigrés in Australia/NZ to warrant even SCPC-squared service; channel ORT 1 is the base service here, second is REN TV +. Parameters are 12.744H, Sr 3.470, 3/4". (CSutton, Denver, NZ)

Optus B3/152E: "On April 2 two Balkan (Serbian) channels (BN TV, BK TV) left UBI MUX with following explanation:

'This channel is temporarily unavailable. The interruption to our broadcast is related to a court dispute between UBI World TV and TV Plus over broadcasting rights which will be resolved by mid-May 2005'.

On April 15th text message was amended with 'and others' following 'TV Plus' and 'is expected to be resolved' in place of 'will be resolved'. Message continues on two UBI channels". (IF, Qld). "On April 7, 12.701Hz became FTA labelled 'TLMZ', carrying Tele-Liban (Arabic and French) + Mazzika

Channel Changes for ABC, SBS, and
Seven Central services (excluding WA)
between 1 Nov 04 - 15 Feb 05

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RECEIVER INFORMATION

For any problems with ADB, Panasonic or UEC receiver reception, powering off the receiver at the power outlet then repowering the receiver should overcome any problems.

For Assistance Contact Your
Equipment Supplier

Help Line 1800 139 994

Page 7 of 7

How do you communicate with digital viewers? Optus, never skilled at informing viewers of important changes in programming line-ups, chose this almost helpful approach to alerting to major changes (early 2005) in Aurora delivery platforms. "For Assistance Contact Your Equipment Supplier", says it all.

Music TV (Arabic). On 11 April TLMZ went to a blank screen until 13th, came back with new logo 'Panorama TV' and airing an array of Arabic channels one after the other, with Tele-Liban only late at night. On April 7, 'SCTV' moved to 12.640Hz, Sr 22.500, 3/4 where it remains (FTA) with variety of programming. Also April 7, Kurdistan TV moved from UBI Ch 40 to 43. Apparently a new Spanish language package is scheduled on UBI's channels 38-42 including TVE International, Telefe International, Cine Latino + 3 others". (IF, Qld) (Editor's note: If stability was a measure of business skills, UBI management would be a loose cannon bouncing off of walls almost daily. How does one build viewer support and loyalty when the service channels are constantly being jumbled up?)

Optus C1/156E: "New (Foxtel) mux 12.720V, Sr 27.800, 3/4 repeating 12.478Hz". (MS, Sydney) "T11/12.305H, Sr 30.000, 3/4; new channel is labelled 'Boot' and EPG reads, 'Boot Service 26700:@BS' ". (AI, NSW)

PanAmSat PAS-2/169E: "Former WA transponder used by WIN etc. now reactivated on test basis; 12.716H, Sr 30.800, FEC 2.3 with up to 6 NTSC colour bar patterns". (CraigS,

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. Photos of yourself, your equipment or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady. Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you. Deadline for June 15th issue: June 4th by mail or 5PM NZT June 5th if by fax to 64-9-406-1083 or Email skyking@clear.net.nz.

Report on the Satmax Seminars (Anthony Dunnett)

"The Christchurch seminar was well represented; in excess of 130 attendees between Auckland and Christchurch, including attendees from South Africa and Thailand.

"The questions (during question and answer sessions) were varied, very refreshing, to see so many people wanting to exchange ideas and information. The hands on (sessions) were a great success, with (virtually) everyone taking their turn. My old satellite equipment (dating back to 1985) got an airing so people could see how things have progressed in the last twenty years. There was lots of interest in international satellites, and of course TVNZ's DVB-T/DTT demo was shown in Auckland as well as VSat. (Mark Fahey's) Satdirectory (p. 2, here) played on a large screen TV as did TV5, TVNZ and DVB-T. Question time produced spot prizes; LNBs and other goodies were handed out and a STB was 'first prize'.

"(Seminar co-producer) Triax with the turn out that they were off to Australia for another round; they have pledged two round trips to Denmark, all expenses paid, for the top performers (sellers of Triax hardware), over the next 12 months. In Christchurch, it was a disappointment that Globecast and TVNZ declined to participate; the VSat demo by Nigel Clough and the Triax courses were very informative.

I believe everyone came away from both seminars with a renewed enthusiasm that our fledgling industry is on the way up. Perhaps the losers here were TVNZ and Globecast; it is doubtful that unless they hold such an event for themselves (in both Christchurch and Auckland) they will get so many installers in one place on hand to learn.

I observed almost every person carrying a signal meter or Spec An(s) and that also showed the level of commitment."

The 'Broadcast Flag' Scheme

By now, most people realise that once a TV broadcast, or movie, or piece of porno film, is translated into a digital data stream, it can be transmitted through internet, an in-home wired or wireless system, on DVD or even CD to one or a million (plus) secondary user sites. Copyright owners, the people who control the content of all forms of recorded materials, are livid at the possibility. In the 'VHS era, copying a movie, without permission of the copyright owner, was a challenge. VHS technical limitations prevented making more than a couple of 'copies of copies' so while making the first one was breaking a law, it was essentially a non-self-repeating exercise in eventual futility. Copies? Yes. Lots of copies? Only with superior (read: expensive) technology. Alas, a 'digital master' can be copied (and recopied) forever. Millions of copies, each one as 'pristine' and as technically-good as the original. "Harry Potter and the Half Blood Prince"? Get your hands on an original (any original - there will be more than 8,000 of them when the film is released) and you have a massive business opportunity. Illegal? As hell. Profitable? Millions of bucks, over night; which is why folks play in this grey market game.

The 'broadcast flag'. So paranoid have the rights owners become that even *terrestrial* commercially sponsored broadcast television now comes into focus. You remember VHS or perhaps even Beta tape? They were what people used yonks and yonks ago (like last week) to record for later viewing popular commercial network (or - let's be honest here - Foxtel, Austar or Sky NZ pay TV) programming. VHS recordings of TV shows were a mixed bag - networks picked up some viewers whom they missed 'live' but in the process, the late-viewers worked out how to 'fast forward' over commercials. The TV stations said, 'Hey - that is sneaking into the circus performance under the edge of the tent'. One well respected US network executive even had the guts to seriously suggest, "When you record a show, and do not watch the commercials, you are stealing (pirating) the programming."

So along came this creative person who said, 'Hey - as we transition from analogue (VHS) to digital (TiVo, hard drives or whatever it may be called - such as iQ by Fox), let's 'fix' the VHS break in the dike. Let's make it 'our choice' whether people can tape tonight's newscast or 8PM special. "Before the masses have access to unlimited copying and sharing opportunities, with digital technology, let's shut them off before it begins".

The broadcast flag.

Buried in all TV programming in America, from July 1 onward, will be a few data bits someone has chosen to call 'The broadcast flag'. And buried inside of all VHS, hard drive, digital, PC TV tuner gadgets on sale July 1 and onward in America - a companion bit of software that will 'recognise' this 'flag' thingy.

'The flag' has several operative states. State one: It says "This programme is OK to record and share to as many people as you wish". State two: "You may record this programme but you may not share it more than one time".

State three: "You may *not* record this programme; period." There are two important points here: Older (pre July 05) style PC tuners, hard drives, TiVO like machines are NOT intimidated by this 'flag'. They will record anything, which will make 'older-is-better' hardware very valuable in the years to come. And, in state two, 'sharing once' will NOT include transferring your video-capture to internet. Not ever. Around your house to one or more alternate receiver locations? Ok. To a second recording machine (in or out of your house)? No.

The 'Broadcast Flag' is not a consumer friendly format; nor was it intended to be. In state one or two, you will be able to make your own archival recording but not in state three. Unless of course some clever person works out how to 'lower' the 'flag' (which perhaps should have been named the 'broadcast wall').

This is a USA-only thing - right??? On July 1. But thereafter, well, the US has already advised Australia at the highest diplomatic level it 'must observe the copyright of US programming' or something nasty will happen to USA-Australia 'relations'. Like Australian products will no longer be accorded favourite nation status in the USA.

Bottom line? Yes, there is a USA mandated 'broadcast flag' in *your* future; thank you Uncle Sam.

Makes you angry? It should - you have just lost 'another freedom'.

NZ). "Signal is lower in level than 12.281V". (S, Taupo, NZ)
"100% on 2.3m solid". (Mackay, N. Qld)

Telstar 18/138E: "3804V, Sr 3.034, VPID 512, APID 4112; LTV Laos + Laos Radio". (B. Richards, SA)

Soapbox: "Telstra has been quietly negotiating for Hollywood film rights for release on internet, much to the chagrin of its Foxtel partners Nine Net and Murdoch. Telstra wants to introduce 'triple play' (telephony, internet and video service) through broadband high speed web connections as early as December of this year. If Telstra can work out the details, Hollywood films scheduled for Foxtel will be available through Internet on a per-view basis months ahead of their Foxtel 'window' which of course will reduce Foxtel's position in the marketplace. We live in interesting times". (CorbinW, Sydney) "The USA's number two Ku DBS provider, DISH TV, is expanding into the Pacific; the Philippines to be precise. In a partnership with Philippine Long Distance Telephone Co (PLDT), EchoStar (owner of DISH) plans a mega-channel satellite (Mabuhay Sat) delivered service (Ku band) and will import from the USA a small but carefully selected group of TV (and radio) channels for redistribution throughout the Philippines. Target date? Not announced by before year end seems logical." (JuanL, Manila) "A new law going into effect during June ('Broadband standards'), Australian ISPs (Internet Service Providers) will first time be able to compete with Foxtel, Austar and Optus using a 'ADSL2' and 'ADSL2+' technology. New rules will allow ISPs to become 'Mega-ISPs' offering radio channels, DVD-quality TV programming (on demand) at delivery speeds up to 24 Mbps. Telstra remains largely in the driver's seat although the new regulations give ISPs their

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first opportunity to compete on a more (if not totally) 'level playing field'. Technically, ISPs are able to install DSLAMs (Digital Subscriber Line Access Multiplexer) which will be capable of connecting subscribers to the broadband (fibre optic) trunk in telephone exchanges. This will, in turn, release ISPs from being forced to purchase wholesale broadband from Telstra. In theory, 150 TV channels could be on offer through the ISP's server". (DR Jenkins, NSW) "The

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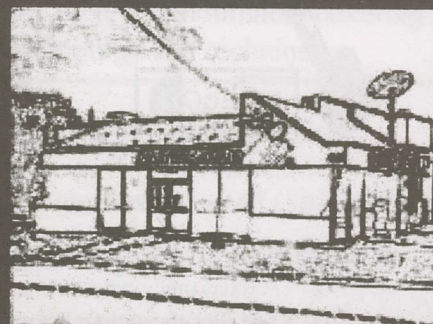
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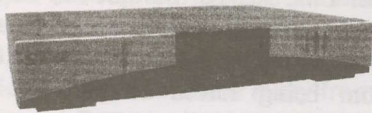
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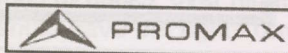
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bandwidth march continues in USA at telephone service level; Verizon is ready to offer 30 Mbps in select US markets. Verizon calls the new offering 'Fios', prices it at US\$35 per month for 2>5 Mbps, US\$45 per month for 15 Mbps (speed). At 30 Mbps, a 2 hour movie could be downloaded in around 12 minutes time. This is a serious challenge to the satellite folks". (AnthonyK, Los Angeles) "The BBC continues under press attack from a trade association calling itself, 'Intellect'. They claim the BBC's promotions over the air, in print and on the web are focusing on promoting 50 pound cost DVB-T STBs and are losing the larger plot of converting to digital as a matter of national interest. The BBC promoted 'Freeview' system has been a runaway success in the UK, challenging Murdoch's BSkyB for leadership in the conversion to digital household race. Intellect believes that by promoting low cost DVB-T, the BBC is missing the main action which they say is 'higher quality programming' using DVB-T technology. The BBC defends its posture in this by noting, 'First we have the conversion to digital, then we worry about whether it is capable of pay to view or HDTV, down the track'. (Clifford, London) "Sources for Russian TV on Internet include <http://tv.rtv.ru/webtv2/usa/rtvip>". (JE, NZ) "Terrestrial 12 GHz (12.338Vt), Indian programmed Mirchee TV, is using ex-IHUG transmitters from Auckland Sky Tower. Sr 27.500, 7/8 FEC; very strong (9 dB C/NR with only LNBF; no dish!" (SJohnson, NZ) (Editor's note: BCL provided secondary transmitter, Waitarua, to be same parameters but Hz polarity.) "Triangle Television (Auckland) has been approved for 100W transmitter relay at Pine Hill (North Shore) location; hope to be on air by 1 August". (JBlackman, Auckland) "Current Matchmaster catalogue references 'New January 1 Foxtel Specifications' when detailing 5 input/12 output multiswitch (21MM-MSV512) and 5 in/out/16 output version (21MM-MSV516), claiming both are 'cascadeable multi-tap 5 cable solutions'. Previously Foxtel allowed no more than 3 inputs on multiswitches - this apparently is a part of the new Foxtel interest in MDU (multiple dwelling unit) subscribers?" (AI, NSW) (Editor's note: With single dwelling unit [SDU] home subscriptions slowing down, it was inevitable that Foxtel would eventually elect to create a technical package for MDU. Lacey's.tv [Victoria] reports significant increase in MDU activity since January.) "If those who subscribe to Foxtel's 'Adults Only' are wondering why Friday night start time is delayed past normal 10:45PM - they are using this programme channel to feed GTV9 Melbourne's 'AFL Friday Night Footy' (no, not available to Foxtel or Austar subscribers). And, 'Adults Only' movies will not record on the 'IQ' - they are blocked by software bits from recording". (Ivan, NT)

Then there was 1: Sky NZ + Foxtel?

Australian financial analyst Ivor Ries is suggesting that given Foxtel's lack lustre performance (1,000,000 subscribers) when compared to Sky NZ (600,000 for a country 1/6th the size), "it would seem very, very sensible to merge (SKY NZ and Foxtel). (There are) two overlapping infrastructures - not the smartest thing. The Sky NZ business makes good money, it's a well run business, so they could do worse things than get (Sky NZ) to run Foxtel; certainly the Sky people in NZ have done a better job". Murdoch's News Corp owns 78% of Sky NZ through subsidiary INL; 25% of Foxtel.

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AND MORE IS ON THE WAY (Gerry is really crankin' 'em out!)

Available 15 July 2005: The CATJ (**Community Antenna Television Journal**) collection; 1973-1980. The "*real birth*" of home dish systems is here, complete with the agony of those who would try to kill it before it happened. Some really ugly stuff from some really ugly people who saw in home dishes a 'commercial challenge' to their control of the airwaves. As it happened, unpurged and real. **PLUS** - The CSD (**Coop's Satellite Digest**) collection; 1979-1987. The entire development period of home dishes, the nuts and the bolts and the crazies who made this the last great 'home workshop' rebellion in our world's history. Very funny (in places), very sad (in others). Including the defeat of the world's first CA (encryption) systems and the inside story of who did it and where!

Available 15 August 2005: Bob Cooper's '**TV Reception Addendum Two**'; tracing the development of long distance, fringe-area, TV reception from the late 40s through the mid 60s; 'television's glory years'. Includes collection sets of famous early publications, '**DXing Horizons**', '**TV Horizons**', excerpts from Radio-Electronics, Wireless World, Popular Electronics and Radio-TV News (monthlies) covering the development of fringe area and 'beyond-fringe' reception technology and techniques.

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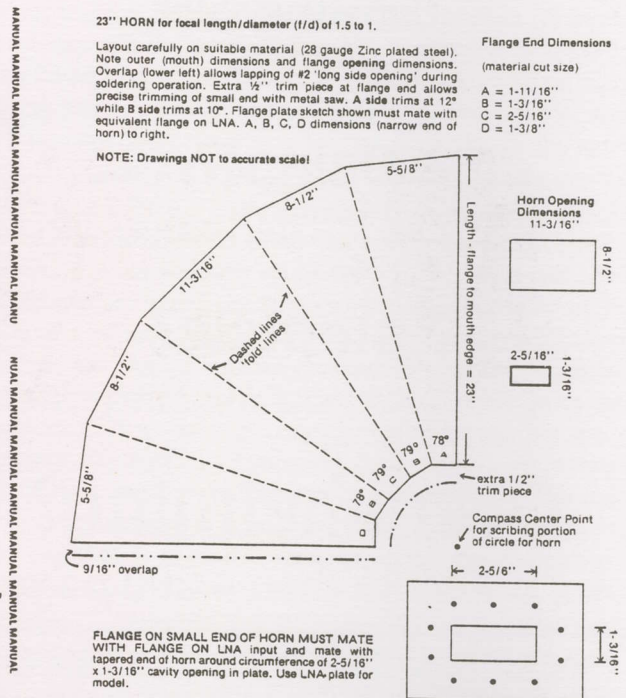
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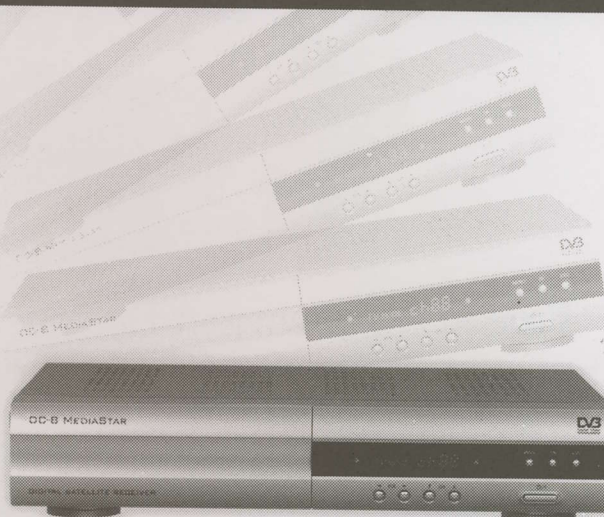
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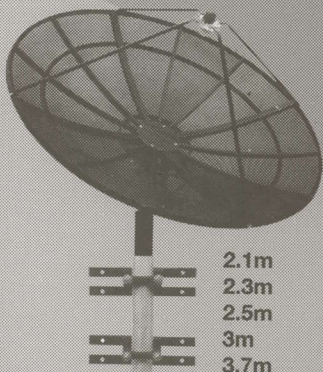
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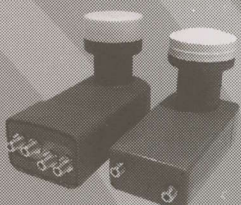


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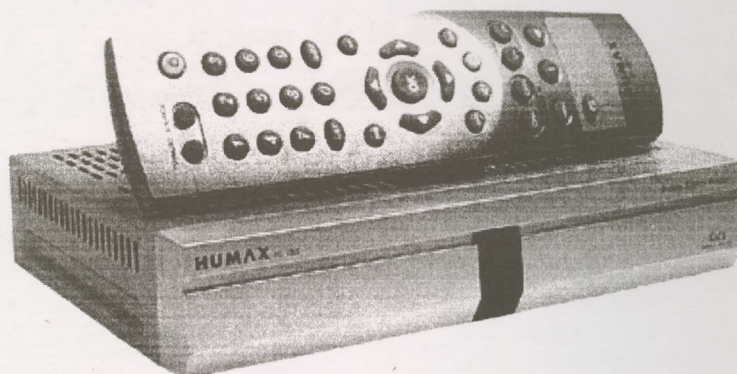
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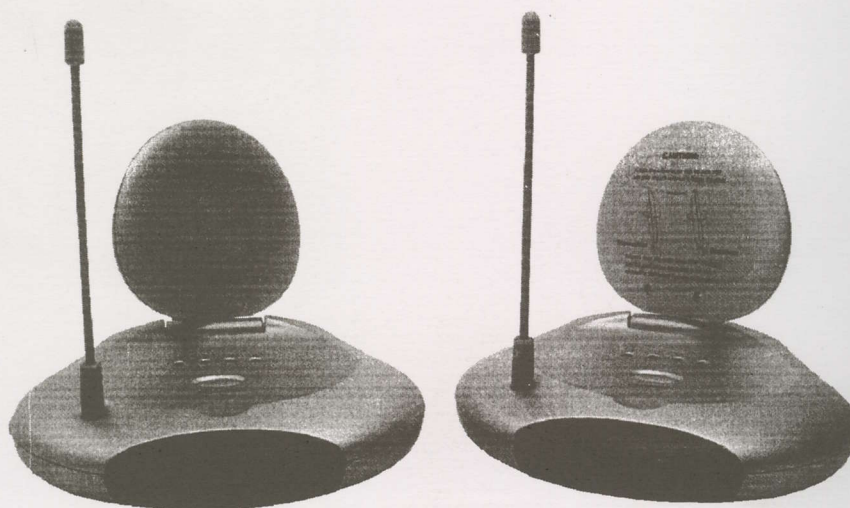


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